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**MILITARY AFFAIRS**

**No. 1650**

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## MILITARY-POLITICAL ISSUES

### COMMENTS ON EAST, WEST BALANCE OF MILITARY POWER

Moscow MOSCOW NEWS in English No 3, 24-31 Jan 82 p 5

[Article by Lev Semeiko, Cand. Sc. (Military): "NATO and the Warsaw Treaty: The Real Balance of Military Power"]

[Text]

The balance of military power between the USSR and the USA, the Warsaw Treaty and NATO at different levels—strategic, "Eurostrategic", and conventional—is one of the world's most acute problems. The enemies of defence are inflating the myth of a "military superiority" of the Warsaw Treaty Organization over the NATO. The alleged military "lag" of the USA and NATO is presented as the main reason for intensifying the arms race, for demands for the unilateral disarmament of the USSR and for accusing the Soviet Union of expansionism and aggression.

Actually neither side has any "military superiority" over the other. "The military and strategic equilibrium prevailing between the USSR and the USA, between the Warsaw Treaty and NATO, objectively serves to safeguard world peace"—this fundamental principle has been recorded by the 28th Congress of the CPSU. What are the indicators of that equilibrium? How is it assessed in the East and in the West?

The balance of military power is measured not only by quantities of missiles, planes, tanks, combat vessels and so on. While these indicators are important, qualitative factors (i.e., the combat potential of every item) are equally important. One side's advantages in a particular field are offset by the opponent's advantages in another field. The geostrategic factor is also exceedingly important. It includes the geographical position of individual states (in particular the most powerful states) and blocks as a whole, the size of defended territory, the length of borders, the direction of strategic threats, etc. Here are some examples. The armies of the Warsaw Treaty countries have to defend an area of 23.5 million square kilometres, but the NATO armies defend only 2 million square kilometres. The USA has no encircling on its northern or southern borders while the Soviet Union is threatened practically

from every direction. This has to be taken into account in determining the size and character of military force necessary to ensure defence.

The USSR believes that all the indicators of military power must be taken into account together. This is not what the West thinks. As a rule, it tends to underestimate certain factors in order to emphasize the "threat from the East". The advantages of the other side are exaggerated while its own strengths go unmentioned. Factual data is distorted. All this leads to the conclusion alleging that the Soviet Union has "military superiority".

Let us consider two of the most frequently mentioned areas of military balance, that is, medium-range nuclear arms and conventional forces. Let us give a summary of the Eastern and Western views on these problems.

What is the balance of medium-range nuclear armaments in

Europe?

West. The USSR has a superiority in that field. President Reagan has said that by any objective criteria the Soviet Union has a balance of advantage in the ratio of 6:1. Elaborating on that Director of the Bureau of Military Political Affairs at the State Department Richard Burt said that the USA has 560 planes and the USSR 3,825 medium-range missiles and planes. Other estimates put Soviet "superiority" at between 3:1 and 2:1.

Declarations of the balance of forces—some at the highest official level—are sufficiently well known.

And there are other assessments. General Brown, Chairman of the Joint Chiefs of Staff, declared on February 7, 1978: on the whole, the USA has a pronounced superiority in medium-range weapons. And *The Wall Street Journal*, writing in the same vein on November 20, 1981, stated that NATO has a substantial advantage over the Soviet Union in medium- and short-range weapons in Europe. Thus Western assessments vary greatly.

East. There is military-strategic equilibrium in Europe. In 1975 the USSR had 1,021 medium-range weapons to NATO's 1,025. At present the Soviet armed forces have 975 medium-range means of delivery as against NATO's 986. Here is the breakdown of these figures.

## MEDIUM-RANGE NUCLEAR POTENTIALS IN EUROPE

	Missiles	Planes	Total
<b>USSR</b>			
land based	496		
sea based	18		
Total	514	461	975
<b>NATO</b>			
<b>USA</b>		723	
F-111, FB 111			
F-4, A-6, A-7 planes	723		
<b>BRITAIN</b>			19
Polaris	64		
Volcano	55		
<b>FRANCE</b>			144
S 2, S-3	18		
M 20	80		
Mirage IVA	46		
NATO total	162	824	986

The current Soviet replacement of obsolete medium range SS 4 and SS 5 missiles by new SS 20 missiles does not increase the total number of missiles. For every new missile one or two old missiles are dismantled and turned to scrap together with their launchers. Thus the general 1:1 ratio of the medium range means of delivery is preserved.

NATO, however, has a 1:1.5 lead in the number of nuclear warheads per launch.

The withdrawal of 1,000 US nuclear weapons from the European continent, much publicized in the West, does not reduce the nuclear capability of American forces in Europe. These are obsolete weapons nuclear mines and nuclear shells intended for artillery weapons, not for medium range carriers. Thus, the pullout of some of America's nuclear weapons from Europe brings no change to the balance of medium-range nuclear armaments.

Why the great difference in the assessment of the medium-range nuclear balance?

West. Different criteria are used in calculating the number of delivery means, in determining what are and what are not medium range weapons, and the number of these weapons in the possession of each side.

East. One arrives at the 1:1 balance by using a comprehensive criterion, i. e., by including among the medium range weapons all the main missile and air

borne nuclear armaments of the NATO countries that could reach targets in Soviet territory from the territories of West European countries and the seas surrounding Europe i. e. those that possess a range (radius) of 1,000 km and more (but less than intercontinental range) and the corresponding Soviet weapons of similar range deployed in the European part of the USSR.

Western assessments of Soviet nuclear potential include means of delivery with a range of less than 1,000 km and, astonishingly, means that are incapable of carrying nuclear weapons. And these numbers are so variously assessed that sometimes quite fantastic figures are arrived at. At the same time many types of carriers are omitted from the list of NATO medium range nuclear means of delivery. That accounts for the "gap" in assessments and claims that the Warsaw Treaty has a six fold advantage over the NATO. While in some cases this is apparently the result of analytical errors, in other cases the West deliberately distorts data.

What is the best way to reduce the level of a nuclear confrontation in Europe, from the political and military points of view?

West. To give a short answer it is the "zero option" carried out within the framework of NATO's "two track decision", that is, to prepare to deploy, within under two years, new American missiles and at the same time to talk about bringing down the level of a nuclear confrontation in Europe. Such should be the background for the implementation of the "zero option" proposed by President Reagan on November 18 last year.

The "zero option" boils down to this: the USA is ready to call off the deployment of a new generation of American nuclear missiles in Europe if the USSR dismantles all its medium range missiles including the SS-20, SS 4 and SS 5. According to Reagan, "this would be an historic step", "this, like the first footstep on the moon, would be a giant step for mankind". In that case the USSR and the USA would have no medium range missiles in Europe which in itself would symbolize parity of forces and would meet the demands of the European peoples for the removal of the nuclear missile

threat from the continent. At the same time, Casper Weinberger declared immediately after the "zero option" idea was proclaimed that the American President's proposals do not signify any slackening of the Republican administration's resolve to build up the US military potential.

East. The best way is by reducing the programme of curtailing nuclear arms in Europe and by a step by step movement towards a nuclear free Europe, i.e. a Europe without medium range and tactical nuclear weapons. To achieve that the starting point has to be correctly determined. It could be an East West moratorium on the deployment of new and the modernization of existing medium range weapons in Europe while the Geneva talks are being held. In that case the USSR would be prepared as an act of goodwill, to unilaterally cut some of its medium-range nuclear weapons.

The USSR is prepared on the basis of reciprocity with the USA to cut the number of its medium range nuclear means by hundreds of missiles. Moreover the USSR is ready to come to terms on a complete renunciation by the sides of all medium range nuclear weapons directed at targets in Europe. The Soviet Union would agree to a genuine "zero option" that would free Europe of nuclear weapons, both medium range and tactical.

What would the realization of Reagan's "zero option" mean in numerical terms?

West. The USSR would have to dismantle hundreds of its medium range missiles. The USA has no such missiles. But instead the USA would not deploy 108 Pershing-2 missiles and 464 Tomahawk cruise missiles. In view of the Soviet superiority in this type of nuclear weapons "we could substantially weaken the sinister threat of nuclear war that hangs over the peoples of Europe given Soviet agreement" (Reagan).

East. After cutting 496 land-based missiles the USSR would be left with 479 medium range weapons. In other words, the USSR would have reduced its might by more than 50 per cent. NATO would keep its

900 weapons. That would result in a 1:2 superiority for NATO. Thus NATO's present 50 per cent lead in the number of warheads per launch of medium range missiles would be replaced by a 100 per cent lead. The implementation of the American "zero option" would mean unilateral disarmament for the USSR. The Soviet Union has no grounds for disarming itself in this way in the face of the growing NATO military potential. Reagan in the above quoted statement says "we could together..." But here is another quotation from his speech: "We cannot reduce arms unilaterally". So the USSR "must" and the USA "cannot". This is the principle of equality and equal security as seen by Americans. But no serious talk about disarmament is possible if only one side is required to disarm. A drastic unilateral disarmament could merely undermine security, national and international.

What is the balance between the Warsaw Treaty and NATO in conventional armaments and forces?

West. The Warsaw Treaty has a "edge" on NATO on all counts.

East. The claim of "Soviet military superiority" is wrong, as various Western experts admit.

Troop strength: According to the London Institute for Strategic Studies (The Military Balance, 1981-1982), the total troop strength (in thousand men) stood at: 4,933 for NATO

and 4,788 for the Warsaw Treaty; the strength of land forces in Europe stood at 2,133 for NATO and 1,669 for the Warsaw Treaty.

The existence of an approximate parity is confirmed by a group of American experts from the Carnegie Fund who studied the troop strength of the sides in Central Europe in 1976-1980. NATO had 1,096,010 and the Warsaw Treaty 1,124,000 men. The data on the strength of land forces and air forces in Central Europe exchanged at the Vienna talks (as of January 1, 1980) also indicated a balance: NATO had 991,000 men and the Warsaw Treaty 979,000 men.

Tanks. The Warsaw Treaty do indeed have more tanks. But NATO also has a lot of tanks and NATO leaders have been understating the numbers of their tanks (quoting a figure of 12,000). Actually, the troops have 16,000 tanks and in addition there are 8,000 mothballed tanks in Europe (4,400 American and 6,500 West European). These could be operational within hours. Consequently, one should proceed from the figure of 24,000 NATO tanks.

However in calculating the balance of forces one must take into account the antisank capability of the sides. The former US Undersecretary of Defense, William Perry declared that the NATO countries have about 193,000 very effective antitank guided missiles (ATGM) and the most diverse means of their combat use. According to the London Institute for Strategic Studies, NATO had four times

more ATGM launchers than the Warsaw Treaty. So the NATO's "tanks + ATGM" total gives a certain Warsaw Treaty advantage in tanks.

Air forces. In assessing the balance of tactical air forces in Europe where we also find parity one must bear in mind that the overwhelming majority of the Warsaw Treaty planes are geared to defensive tasks within the air defence system, while most of the NATO planes have offensive capabilities (deep strikes, support of troops, etc).

\* \* \*

The Soviet Union is firmly committed to reducing the existing military strategic balance in the world on the basis of equality and equal security, provided the security interests of neither of the sides are damaged. The Soviet Union resolutely opposes the very notion of nuclear superiority. To try to win the arms race and to count on a victory in a nuclear war is a dangerous madness. But, as the 26th Congress of the CPSU has stressed: "But neither will we permit the building up of any such superiority over us. Attempts of that kind and talking to us from a position of strength are absolutely futile." These words take on added significance today, when Soviet-American talks on medium range nuclear armaments are underway, the Vienna talks on reduction of armed forces and armaments in Central Europe are in progress and the SALT process is to be resumed.

ARMED FORCES

MILITARY PROCURATOR: TEXT OF NEW STATUTE

Moscow VEDOMOSTI VERKHOVNOGO SOVETA SOYUZA SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK  
in Russian No 32 (2106), 12 August 81 pp pp 767-783

[Ukase No 956 of the USSR Supreme Soviet Presidium on Approving the Statute on  
the Military Procurator's Office]

[Text] In accordance with Article 12 of the USSR law "On the USSR Procurator's  
Office", the Presidium of the USSR Supreme Soviet resolves:

1. to approve the Statute on the Military Procurator's Office
2. to recognize that the following are no longer in effect.

The 14 December 1966 Ukase of the Presidium of the USSR Supreme Soviet, "On  
Approving the Statute on the Procurator's Office" (VEDOMOSTI VERKHOVNOGO SOVETA SSSR,  
No 50, 1966, Article 1021);

The USSR Law dated 19 December 1966 "On Approving the Ukase of the Presidium of  
the USSR Supreme Soviet 'On Approving the Statute on the Military Procurator's  
Office'" (VEDOMOSTI VERKHOVNOGO SOVETA SSSR, No 51, 1966, Article 1050);

Article 6 of the 26 November 1973 Ukase of the presidium of the USSR Supreme Soviet,  
"On the Introduction of Changes and Additions in Some USSR Legislative Acts"  
(VEDOMOSTI VERKHOVNOGO SOVETA SSSR, No 48, 1973, Article 679).

Chairman of the Presidium of the USSR  
Supreme Soviet L. Brezhnev

Secretary of the Presidium of the USSR  
Supreme Soviet M. Georgadze

Moscow, Kremlin, 4 August 1981

Statute on the Military Procurator's Office  
Chapter 1. General Propositions.

Article 1. The highest supervisory power for the execution of laws in the USSR  
Armed Forces.

In accordance with the Constitution of the USSR and the USSR law "On the Procurator's Office" the highest supervisory power for the accurate and uniform execution of laws in the USSR Armed Forces is placed on the procurator general of the USSR and the military procurators subordinate to him.

The procurator general of the USSR directs the activity of the military procurator both directly and through the chief military procurator.

#### Article 2. The tasks of the military procurator.

The military procurator in carrying out the tasks placed on the USSR procurator's office by the USSR law "On the USSR Procurator's Office" directs his activity toward strengthening in every way possible socialist legality and law and order in the USSR Armed Forces and defends against any encroachments:

the security of the USSR, the combat capabilities and combat readiness of its armed forces, military discipline, and the established procedures for performing military service;

the rights and freedoms of servicemen, military construction personnel, reservists called to active duty, members of their families, workers and employees of the USSR armed forces, and other citizens;

the rights and legal interests of troop units, establishments, military training institutes, enterprises and organizations of the USSR armed forces.

By means of all its activity, the military procurator's office contributes to instilling in officials of the USSR armed forces and all servicemen and reservists called to active duty a correct and strict execution of the Constitution of the USSR, Soviet laws, the military oath and military regulations and observance of the rules of socialist society.

#### Article 3. Basic directions in the activity of the military procurator's office.

According to the tasks placed on it, the military procurator's office operates in the following basic directions:

Supervision over the execution of laws, military regulations and other military legislative acts by all military control organs, military units, establishments, military training institutes, enterprises, organizations, commanders (chiefs) and other officials of the USSR armed forces, all servicemen and reservists called to active duty, military construction personnel, and other persons in relation to whom there are special instructions in the legislation of the USSR, as well as by workers and employees of the USSR armed forces when performing their service duties (general supervision);

Supervision over the execution of laws by inquiry organs operating in the USSR armed forces, the investigators of the military procurator's office, as well as by the inquiry organs and investigators of the state security organs when they are investigating cases within the jurisdiction of military tribunals;

Supervision over the observance of laws and military regulations in guardhouses, in other places for holding detained and arrested servicemen and military construction personnel, in disciplinary units as well as during the carrying out of punishments, imposed by military tribunals, in troop units.

The military procurator's office combats crime, violations of the laws concerning the protection of socialist property, and other offences in the USSR armed forces. The conducting of pre-trial investigations in criminal cases, the instituting of criminal proceedings against persons who have committed crimes, the insuring of the inevitability of responsibility for crimes, the taking of steps to prevent offences and to expose and eliminate their causes and the conditions contributing to them have been placed on it.

The military procurator's office participates in the development of measures by the command element and political organs to strengthen legality and law and order and prevent crimes and other offenses and in the preparation of recommendations to improve military legislation and to publicize Soviet laws in the USSR armed forces.

#### Article 4. Principles for the organization and work of the military procurator's office.

In accordance with the USSR law, "On the USSR Procurator's Office," the military procurator's office is included in the united and centralized system of the USSR procurator organs, headed by the USSR procurator general, with the subordination of the lower military procurators to higher ones, to the chief military procurator and to the USSR procurator general. The chief military procurator is subordinate only to the USSR procurator general.

The military procurator's office consists of the chief military procurator's office and the military procurator offices of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, fleets, armies, flotillas, large units, and garrisons, as well as the military procurator offices equal to the military procurator offices of armies, flotillas, large units, and garrisons.

#### The military procurator's office:

operates on the basis of socialist legality and in accordance with the Constitution of the USSR, the constitutions of the union republics, the constitutions of the autonomous republics, and Soviet laws;

exercises supervision over the correct and uniform application of laws despite any local differences and in spite of any local and departmental influences whatsoever;

takes steps to expose and eliminate in a timely manner any violations of the law no matter from whom they originate and to restore violated rights and institute proceedings, prescribed by law, against the guilty ones;

cooperates with the military command element, political organs, military tribunals, public organizations, and troop collectives; and relies on the active help of servicemen and other citizens in the task of strengthening legality and law and order in the USSR armed forces.

The military procurator's office exercises its authority regardless of any local and military organs whatsoever, being subordinate only to the USSR general procurator.

#### Article 5. Legislation on the military procurator's office.

The organization and procedure for the work of the military procurator's office are defined by the USSR law "On the USSR Procurator's Office", the present statute, and other USSR legislative acts. The procedure for the execution of their authority by the military procurators and the investigator's of the military procurator's office during legal proceedings are defined in the legislative acts of the USSR and union republics.

#### Article 6. Appointment of military procurators and the period of their term of office

The chief military procurator is appointed by the Presidium of the USSR Supreme Soviet based on the recommendation of the USSR procurator general.

The military procurators of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, and fleets are appointed by the USSR procurator general based on the recommendation of the chief military procurator.

The military procurators of armies, flotillas, large units, garrisons and military procurators equal to them are appointed by the chief military procurator and approved by the USSR procurator general.

The term of office of the chief military procurator and of all lower military procurators is five years.

#### Article 7. The authority of the chief military procurator in directing military procurator offices.

The chief military procurator directs the activity of military procurator offices; exercises control over their work; ensures the selection, placement, education, and improvement in qualifications of military procurator office personnel; conducts the certification of military procurators and of military procurator office investigators; issues orders and instructions within the limits of his competency; and gives directions binding on all military prosecutor offices.

#### Article 8. Examination of recommendations, statements and complaints by military procurators.

Military procurators must examine in the manner prescribed by law recommendations and statements as well as complaints about violations of the law by military control organs, other establishments and organizations, officials, servicemen, and other persons mentioned in the first part of Article 3 of the present statute; and to take steps to restore violated rights and defend the legal interests of servicemen and reservists called to active duty, of members of their families and other citizens, of the troops units, establishemnts, military training institutes, enterprises, and organizations of the USSR armed forces, and of other state and public organizations.

Military procurators set a personal example for servicemen and other citizens.

Article 9. The participation of military procurators in the development of measures to strengthen legality and law and order.

The chief military procurator participates in the board meetings of the USSR Minister of Defense, of the military councils of the branches of the USSR armed forces, and of the border and internal troops when they are discussing questions on the carrying out of laws and military regulations, on improving legality and troop discipline, on preventing offenses and on the legal education of servicemen. The military procurators of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, fleets, armies, flotillas, large units and garrisons participate in the discussion of these questions during the sessions of the corresponding military councils and service meetings.

The chief military procurator participates in the development of measures by the USSR Ministry of Defense, the Main Political Directorate of the Soviet Army and Navy, and the military councils and political directorates of the USSR armed forces and the border and internal troops to strengthen legality and law and order, prevent offenses, and educate servicemen on legal matters. Lower military procurators participate in the development of these measures by the corresponding military command element, military councils and political organs.

Article 10. The stock-taking of crimes by the military procurator's office.

The military procurator's office makes a unified accounting:

- 1) of all crimes committed by servicemen and reservists called to active duty;
- 2) of all crimes committed by soldiers, sailors, sergeants, master sergeants, warrant officers [praporshchiki i michmany], and officer personnel of the state security organs;
- 3) of crimes committed by military construction personnel and other persons regarding whom there are special instructions in the laws of the USSR;
- 4) of crimes committed by workers and employees of the USSR armed forces in connection with their performance of service duties at the locations of a troop unit, establishment, military training institute, enterprise , or organization of the USSR armed forces.

Commanders (chiefs) immediately notify the appropriate military procurator of each crime and incident.

Article 11. The activity of the military procurator's office in areas where no other organs of the procurator's office are operating.

In areas where because of exceptional circumstances no other organs of the USSR procurator's office are operating, the execution of procurator supervision can be placed on the military procurator's office by the USSR procurator general.

Chapter 2. The Organization of the Military Procurator's Office.

Article 12. The chief military procurator's office.

The chief military procurator's office is part of the USSR procurator's office and is headed by the chief military procurator.

The chief military procurator has a first deputy, deputies, senior assistants, and assistants.

In the chief military procurator's office, there are directorates, departments, an office, and a reception room. The chief military procurator's senior assistants and assistants are the chiefs and deputy chiefs of the directorates and departments. The chief military procurator's assistants are the chief of the office and the chief of the reception room.

In the directorates and departments, there are senior military procurators and military procurators.

Senior investigators for particularly important cases and investigators for particularly important cases are attached to the chief military procurator. There can also be senior investigators in the chief military procurator's office.

The statutes for the structural subunits of the chief military procurator's office are approved by the chief military procurator.

The first deputy, deputies, and senior assistants of the chief military procurator as well as the senior investigators for particularly important cases are appointed and released by the USSR procurator general based on the recommendation of the chief military procurator.

The assistants of the chief military procurator, senior military procurators and military procurators of the directorates and departments and the investigators for particularly important cases and senior investigators of the chief military procurator's office are appointed and removed by the chief military procurator.

Article 13. The board of the chief military procurator.

A board is formed in the chief military procurator's office composed of the chief military procurator (chairman) and other leading workers of the military procurator's

office. The personnel composition of the board is approved by the USSR procurator general based on the recommendation of the chief military procurator.

During its sessions, the board of the chief military procurator's office examines the more important questions concerning the activity of military procurator offices; checks on the carrying out of the USSR procurator general's orders; listens to the reports of the directorate and department chiefs of the chief military procurator's office, of lower military procurators and other workers in the military procurator's office; and discusses questions on the selection, placement and education of personnel and drafts of the most important orders and instructions of the chief military procurator.

The board's decisions are implemented by orders of the chief military procurator. In the event of a disagreement between the chief military procurator and the board, the chief military procurator implements his decision, reporting the arising of a disagreement to the USSR procurator general. In their turn, the board's members can report their opinion to the USSR procurator general.

Article 14. The military procurator's office of a branch of the USSR armed forces, district, group of forces, and fleet.

The military procurator's office of a branch of the USSR armed forces, military district (front), air defense district, group of forces, and fleet is headed by the corresponding military procurator who has a first deputy, deputies, senior assistants, and assistants.

Departments and an office are created in the military procurator offices of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, and fleets. The senior assistants are the chiefs of the departments, and the assistants of the military procurator are the head of the office. The military procurators of the departments are in the departments.

There are investigators for particularly important cases and senior investigators in the military procurator offices of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, and fleets.

The military procurator of a branch of the USSR armed forces, military district (front), air defense district, group of forces, and fleet organizes the work of the military procurator's office and issues orders within the limits of his competency.

Article 15. The military procurator's office of an army, flotilla, large unit, and garrison.

The military procurator's office of an army, flotilla, large unit, and garrison is headed by the corresponding military procurator who has deputies, senior assistants and assistants.

In the military procurator offices of armies, flotillas, large units, and garrisons, there are senior investigators and investigators.

In the military procurator offices of armies, flotillas, large units, and garrisons, procurator, procurator-investigation and investigation sections can be created in accordance with the decision of the chief military procurator.

The military procurator of an army, flotilla, large unit, and garrison organizes the work of the military procurator's office and issues orders within the limits of his competency.

Article 16. The appointment of deputy military procurators and other military procurator workers.

The deputies and assistants of military procurators, investigators, and other military procurator workers, who are servicemen and whose appointment and removal procedure is not established by the present statute, are appointed and removed in a manner defined by the USSR procurator general.

The appointment and removal from their positions of workers and employees of military procurator offices is done by the appropriate military procurator observing labor laws.

Chapter 3. The Authority of Military Procurators and the Investigators of Military Procurator Offices.

Article 17. The authority of military procurators.

The chief military procurator and the military procurators subordinate to him enjoy accordingly all the powers of procurators defined by the USSR law, "On the USSR Procurator's Office" and the present statute as well as by other USSR and union republic legislative acts.

Article 18. The authority of a military procurator in exercising general supervision.

In exercising general supervision, a military procurator within the limits of his competency:

1) demands and obtains orders, instructions, statutes, manuals, directives, and other acts issued by military control organs, commanders (chiefs) and other officials of the USSR armed forces in order to check their compliance with the Constitution of the USSR; the constitutions of the union republics; the constitutions of the autonomous republics; legislative acts of the USSR, union and autonomous republics; legislative acts of the USSR, union and autonomous republics; military regulations approved by the Presidium of the USSR Supreme Soviet; other military legislative acts; and the decrees of the USSR Council of Ministers and the councils of ministers of union and autonomous republics;

- 2) demands from military control organs, commanders (chiefs) and other officials of the USSR armed forces the handing over of necessary documents, material and statistical and other information; the conducting of inspections and audits of the activity of troop units, establishments, military training institutes, enterprises, organizations, services, and officials subordinate to them in connection with existing information on violations of the law; and the assigning of specialists to clear up questions which arise during general supervision;
- 3) checks on the carrying out of laws by military control organs, troop units, establishments, military training institutes, enterprises, organizations, and officials of the USSR Armed forces in connection with statements, complaints and other information on offenses;
- 4) checks on the legality of the administrative detention of citizens and the use of measures by the appropriate organs and officials to influence administrative offenses;
- 5) summons officials, servicemen and other citizens and requires oral or written explanations from them on the occasion of violations of the law;
- 6) appeals orders and other acts issued by military control organs, arbitration organs of the USSR Ministry of Defense, and people's control organs in the USSR armed forces which contradict the law; and appeals the illegal acts and actions of commanders (chiefs) and other officials of the USSR armed forces;
- 7) institutes criminal proceedings in the manner prescribed by law against offenders; brings disciplinary action or action in administrative offenses; transmits in cases, provided by law, material on them to troop collectives, comrade's courts, or public organizations in order to solve questions on the use of public influence measures; and cautions about the inadmissability of violations of the law;
- 8) takes steps to ensure compensation for material losses, caused by a violation of the law, in the way prescribed;
- 9) makes recommendations to military control organs, commanders (chiefs), other officials, and public organizations on eliminating violations of the law, the causes for the violations, and the conditions contributing to them.

#### Article 19. The obligation to carry out the demands of a military procurator.

The demands of a military procurator on the elimination of violations of the law which have been exposed by him, of the reasons for the violations and of the conditions contributing to them; on the handing over of acts and other required documents, material and information; on the conducting of audits and inspections; on the assigning of specialists; on appearances in the military procurator's office and the giving of explanations on the occasion of violations of the law must be carried out by all organs, officials, servicemen, and other citizens to whom these demands are addressed. An audit or inspection must be conducted no later than within a month with the military procurator notified of the results.

Article 20. The objection by a military procurator under the general supervision system.

An objection to an act contradicting the law is lodged by the military procurator in the military control organ which issued the act or in the higher military control organ. An objection to an illegal act or action by a commander (chief) or other official of the USSR armed forces is lodged in the same way.

In the objection, the military procurator has a right to demand cancellation of the act or the bringing of it into compliance with the law, as well as the cessation of the illegal action of the commander (chief) or other official and the restoration of the violated right.

The objection of a military procurator is subject to compulsory review by the appropriate military control organ, commander (chief) or other official no later than within ten days after its arrival. The results of the objection's review are reported to the military procurator.

The lodging of an objection by a military procurator against an act which violates the rights and freedoms, which are protected by law, of servicemen or other citizens as well as in other cases provided by law suspends the operation of that act until the review of the objection.

Article 21. The recommendation of a military procurator.

A recommendation on the elimination of violations of the law, of the reasons for the violation, and of the conditions contributing to them is made to the military control organ, public organization, commander (chief), or other official who has the authority to eliminate the violation of the law, and it is subject to review without delay. Specific measures to eliminate violations of the law, reasons for the violations, and the conditions contributing to them must be taken no later than within a month, and the results reported to the military procurator.

The chief military procurator on the basis of the summarized information makes recommendations to the USSR minister of defense; the chief of the Main Political Directorate of the Soviet Army and Navy; the commanders, members of military councils and chiefs of the political directorates of the branches of the USSR armed forces; the commanders (chiefs) of the arms and services and the chiefs of the political organs of the border and internal troops; and other military control organs and political organs on matters concerning the improvement of legality, law and order, and the struggle against offenses in the USSR armed forces.

The military procurators of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, fleets, armies, flotillas, large units and garrisons within the limits of their competency make recommendations on questions, mentioned in the second part of the present article, to the corresponding military control organs, commanders (chiefs), and political organs.

**Article 22. The ruling of a military procurator.**

Depending on the nature of the violation of the law by a commander (chief), other official, serviceman, or other citizen, the military procurator passes a justification ruling on the bringing of criminal action, the bringing of disciplinary action or the bringing of actions in administrative offenses.

A justification ruling is also passed by the military procurator in other cases provided for by law.

The ruling of a military procurator on the bringing of disciplinary actions is subject to review by the appropriate organ or official no later than within a ten day period after its arrival. The results of the review are reported to the military procurator.

**Article 23. The authority of a military procurator regarding supervision over the execution of laws by inquiry and pre-trial investigation organs.**

In exercising supervision over the execution of laws by inquiry organs operating in the USSR armed forces, by investigators of the military procurator's office, as well as by inquiry organs and investigators of the state security organs when they are investigating cases under the jurisdiction of military tribunals, a military procurator within the limits of his competency:

- 1) demands from inquiry and pre-trial investigation organs criminal files, documents, material and other information on committed crimes and on the progress of the inquiry, pre-trial investigation and ascertainment of persons who committed the crimes in order to check them; and verifies the carrying out of the requirements of the law on taking, registering and permitting statements and reports on committed crimes or ones being prepared;
- 2) brings criminal actions or refuses to bring them; gives written instructions on the investigation of crimes, on the selection change or revocation of measures for suppressing and qualifying a crime, on the taking of individual investigative actions, and on the search for the persons who committed the crime; approves the making of searches, the confiscation and seizure of postal and telegraph correspondence, the dismissal of the guilty one from his position, and other actions of the investigator and inquiry organ in cases provided by law; returns criminal files to inquiry and pre-trial investigation organs with his instructions on the making of additional investigations; and extends the period of the investigation and the subject matter being protected as a suppression measure in the cases and manner prescribed by law;
- 3) revokes illegal and unjustified rulings of investigators and persons conducting an inquiry; removes the person conducting the inquiry or the investigator from any further conduct of the inquiry or pre-trial investigation if a violation of the law has been committed by them during the investigation of the case; and withdraws any case from an inquiry organ and transfers it to an investigator or transfers the case from one investigative organ to another and also from one investigator to another in order to obtain a more complete and objective investigation;

4) participates in the conduct of the inquiry and pre-trial investigation; and, in the required cases, personally carries out individual investigative actions or a complete investigation in any case.

5) ceases or suspends the conducting of criminal proceedings; agrees to the dropping of criminal proceedings by an investigator or inquiry organ in those cases where it is provided by law; approves indictments (rulings); and directs criminal proceedings in court.

The military procurator assigns the execution of warrants on detention, bringing in, confinement, making of searches, seizure, and the search for persons who committed crimes, and the performance of other investigative actions to inquiry organs functioning in the armed forces, the police and any other inquiry organs; he also gives instructions on the taking of the necessary steps to expose crimes and reveal the persons who committed them in cases being handled by an investigator of the military procurator's office or by a military procurator and in those cases being handled by investigators of the state security organs which are subject to military tribunals.

The military procurator's instructions and assignments to inquiry and pre-trial investigation organs in connection with their institution and investigation of criminal proceedings, which are given in the manner provided by criminal procedure laws, are binding on the inquiry and pre-trial investigation organs.

The institution of criminal proceedings and the initial investigation of inquiry and investigation organ, mentioned in Article 3 of the present statute, are immediately reported to the appropriate military procurator.

The chief military procurator, based on the criminal procedure laws of the USSR and the union republics, develops and approves instructions to the inquiry organs functioning in the USSR armed forces.

#### Article 24. Periods for an inquiry and pre-trial investigation.

In cases in which the making of a pre-trial investigation is mandatory, the inquiry organs, mentioned in Article 3 of the present statute, are required to complete the inquiry no later than ten days after the date proceedings are instituted.

In cases in which the making of a pre-trial investigation is not mandatory, the inquiry must be completed no later than one month after the day criminal proceedings are instituted. Included in this period is the drawing up of an indictment or the halting or suspension of the proceedings.

The inquiry period, which is established by the second part of the present article, can be extended by the military procurator who directly exercises supervision over the conduct of the inquiry; however, by no more than one month. In exceptional cases, the period for making the inquiry into a case can be extended in accordance with the rules established by part five of the present article.

The preliminary investigation of criminal cases, being handled by investigators mentioned in Article 3 of the present statute, must be completed in no later than a two month period. Included in this period is the time from the date proceedings are instituted to the moment the case is sent to the military procurator with an indictment or a ruling on the transfer of the case to a court for consideration of the question of applying compulsory measures of a medical nature or of halting and suspending proceedings in the case.

The pre-trial investigation period, established by the fourth part of the present article, can be extended by the military procurator of a branch of the USSR armed forces, military district (front), air defense district, group of forces, and fleet; however, by no more than two months. Further extension of the period of the preliminary investigation can be made only in exceptional cases by the chief military procurator or the USSR general procurator.

#### Article 25. Institution of criminal proceedings and the approval of an arrest.

Military procurators institute criminal proceedings and approve the arrest of servicemen and other citizens suspected or guilty of committing crimes when there is justification and in the manner prescribed by law.

The right to approve arrests belongs: to the USSR procurator general; the chief military procurator; the military procurators of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, fleets, and their deputies; as well as to the military procurators of armies, flotillas, large units, and garrisons.

When resolving questions on approving arrests, the military procurator must acquaint himself carefully with all the material containing the basis for the confinement and, in the necessary cases, personally interrogate the suspected or accused individual and, in all cases -- a minor suspected or accused person.

Confinement during an investigation of criminal cases by the inquiry and investigation organs, mentioned in Article 3 of the present statute, cannot last more than two months. This period can be extended only in view of a case's special complexity by the military procurator of a branch of the USSR armed forces, military district (front), air defense district, group of forces and fleet up to three months and by the chief military procurator up to six months from the date of confinement. Further extension of the confinement period can be made only in exceptional circumstances by the USSR general procurator for an additional period of no more than three months.

#### Article 26. The authority of a military procurator in exercising supervision over the execution of laws during the consideration of cases in military tribunals.

In exercising supervision over the execution of laws during the considering of cases in military tribunals, a military procurator within the limits of his competency.

- 1) participates in the administrative session of the court, in the court examination of cases of the first instance, and in the appeal and review process; gives decisions on questions arising during the consideration of cases; brings suits, hands in statements to the court and gives decisions on the substance of the case on the whole in civil cases; supports before the court the state's charges in criminal cases and, when there is justification, waives the charges; performs other procedural actions provided by law;
- 2) objects to the illegal and unjustified decisions, sentences, decisions, and rulings of military tribunals and rulings of military tribunal judges.
- 3) checks on the legality of appeals to the execution of decisions, sentences, findings, and rulings of military tribunals;
- 4) takes steps in cases provided by law, to review decisions, findings and rulings in civil cases and to reopen criminal proceedings in accordance with newly discovered circumstances.

The chief military procurator, in exercising supervision over the execution of laws during the consideration of cases in the Military College of the USSR Supreme Court, enjoys the powers mentioned in points 1, 3, and 4 of the present article.

#### Article 27. The lodging of appeals and private objections by military procurators.

Military procurators and the deputies of military procurators within the limits of their competency lodge appeals and private objections to illegal and unjustified decisions, sentences, findings and rulings regardless of their participation in the examination of the case in a court of first instance. The assistants of the military procurators and the military procurators of directorates and departments can lodge such objections only in cases in whose consideration they are participating.

#### Article 28. The lodging of objections by military procurators within the supervisory system.

A military procurator has a right within the limits of his competency to demand and obtain from a court any case or category of cases whose decision, sentence, finding or ruling has entered into legal effect. Having judged that the court's decision, sentence, finding or ruling is illegal and unjustified, a military procurator lodges an objection in the supervisory system or, if this exceeds the limits of his competency, addresses a motion to the higher procurator for lodging the objection. In the absence of a basis for the lodging of a protest, the procurator reports his decision and his reasons to the persons, enterprises, establishments and organizations on whose application the case had been examined.

The right of lodging an objection within in the supervisory system belongs to:

the chief military procurator -- to decisions, sentences, findings, and rulings of any military tribunal and the rulings of military tribunal judges;

the deputies of the chief military procurator and the military procurator of a branch of the USSR armed forces, military district (front), air defense district, group of forces, fleet -- to a decision, sentence, finding, and ruling of an army, flotilla, large unit, and garrison military tribunal and the rulings of the judges of these tribunals.

The chief military procurator:

lodges objections within the supervisory system to the decisions, sentences, findings, and rulings of the military tribunals of branches of the USSR armed forces, districts (fronts), groups of forces, and fleets and to the rulings of the judges of these tribunals, as well as to decisions concerning newly discovered circumstances in cases for which decisions, sentences, findings, or rulings have been passed by these tribunals -- in the Military College of the USSR Supreme Court;

lodges objections within the supervisory system to the decisions, sentences, findings, and rulings of army, flotilla, large unit, and garrison military tribunals and to the rulings of the judges of these tribunals as well as to decisions concerning newly discovered circumstances in criminal cases for which sentences or findings have been passed by these tribunals -- in the military tribunals of the branches of the USSR armed forces, districts (fronts), groups of forces, and fleets.

The deputies of the chief military procurator and the military procurators of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, and fleets lodge objections within the supervisory system to the decisions, sentences, findings, and rulings of army, flotilla, large unit, and garrison military tribunals and to the rulings of the judges of these tribunals as well as to decisions concerning newly discovered circumstances in criminal cases in which the sentences or findings have been passed by these tribunals -- in the military tribunals of the branches of the USSR armed forces, districts (fronts), groups of forces, and fleets.

Military procurators send, in the manner prescribed by civil legal procedures, to military tribunals statements concerning their review of the decisions and findings of military tribunals in civil cases in connection with newly discovered circumstances.

Article 29. Suspension of the execution of military tribunal sentences, findings and decisions.

The chief military procurator and his deputies have the right to suspend the execution of a protested military tribunal sentence and finding in a criminal case until the authorization of the case in the judicial supervision system. When there is information which testifies to a clear violation of the law, the chief military procurator and his deputies have a right to suspend the execution of the sentence or finding at the same time as the demanding and obtaining of the criminal records until their objection for a period of not more than three months.

The chief military procurator, his deputies and the military procurators of the branches of the USSR armed forces, military districts (fronts), air defense districts, groups of forces, and fleets, having demanded and obtained within the supervisory system a civil case or a case involving an administrative offense, can suspend the execution of the corresponding decision, finding and ruling until the end of the supervisory review.

**Article 30. The authority of a military procurator in supervising the observance of laws in guardhouses and disciplinary units.**

In exercising supervision over the observance of laws and military regulations in guardhouses, other places for holding detained and arrested servicemen and military construction personnel, and disciplinary units as well as during the execution of punishments, ordered by military tribunals, in troop units, a military procurator within the limits of his competency:

- 1) for the purpose of checking on the observance of laws and military regulations, visits on a regular basis and at any time guardhouses, other places for keeping detained and arrested servicemen and military construction personnel, and disciplinary units;
- 2) familiarizes himself with the documents on whose basis persons have been subjected to detention on suspicion of having committed a crime, to imprisonment pending trial, to detention or arrest in the disciplinary system, as well as those on whose basis persons are serving sentences in a disciplinary unit or guardhouse;
- 3) immediately frees a person who is being illegally held in a guardhouse, other place for keeping detained and arrested persons, or disciplinary unit; or who has been subjected to detention, confinement pending trial, or arrest in the disciplinary system in violation of the law;
- 4) interrogates detained, arrested and sentenced persons;
- 5) checks the compliance of the orders and instructions of commanders (chiefs) and other officials with the laws and conditions of military regulations which regulate procedures and conditions for holding detained, arrested and sentenced persons; and suspends the execution of these acts and objects to them in the event they contradict a law or regulation.

The rulings and recommendations of a military procurator with respect to the observance of procedures and conditions for holding detained, arrested and sentenced persons, which have been established by law and military regulations, are subject to mandatory execution by the appropriate commanders (chiefs) and other officials.

**Article 31. The authority of a military procurator investigator.**

When conducting a pre-trial investigation, the military procurator investigator enjoys all the rights given to an investigator by the criminal procedure laws of the USSR and union republics.

The military procurator investigator in cases being investigated by him has the right to give instructions and assignments for the carrying out of investigatory actions and search measures to any inquiry organs and to demand cooperation from them during the carrying out of investigatory actions. The instructions and assignments of a military prosecutor investigator, given in the manner provided by the criminal procedure laws, are binding on inquiry organs.

Military procurator investigators make recommendations on the criminal cases being investigated by them to commanders (chiefs) or other officials in the manner prescribed by the criminal procedure laws.

The commander (chief) or other official must review the recommendation of a military procurator investigator and take specific steps no later than within a month to eliminate the violations of the law, the reasons for the violations and the conditions contributing to them and inform the investigator about the results.

The rulings of a military procurator investigator, which are made in accordance with the law in criminal cases being handled by him, must be carried out by all military control organs as well as by all establishments, enterprises, organizations, commanders (chiefs), other officials, servicemen, and other citizens.

**Article 32. The investigation of criminal cases by military procurator investigators.**

Military procurator investigators conduct pre-trial investigation in criminal cases related by law to their competency and also in cases assigned to them by the USSR procurator general, the chief military procurator or a lower military procurator.

Military procurator investigators investigate criminal cases:

- 1) involving crimes committed by servicemen and reservists called to active duty;
- 2) involving crimes committed by soldiers, sailors, sergeants, master sergeants, warrant officers, and officers of state security organs;
- 3) involving crimes committed by military construction personnel and other persons regarding whom there are special instructions in the laws of the USSR;
- 4) involving crimes committed by workers and employees of the USSR armed forces in connection with their performance of service obligations or in the locations of troop units, establishments, military training institutes, enterprises, or organizations of the USSR armed forces.

During the investigation of a case regarding one person or a group of persons charged with committing one or several crimes, if the case of one of these persons or one of the crimes is being investigated by the military procurator investigator and that of the others by an internal affairs organ investigator, the case is investigated by the military procurator investigator who observes the rules, which have been established by criminal procedures laws, for combining and separating criminal cases.

## Chapter 4. The Staffing and Logistics Support of Military Procurator Offices.

### Article 33. Requirements imposed on persons assigned to the positions of military procurator and investigator.

USSR citizen officers of the USSR armed forces, who have a higher legal education and who possess the necessary political work and moral qualities, are appointed to the positions of military procurators and military procurator investigators.

Officers no younger than 25 are appointed to the positions of chief military procurator and of military procurators of the branches of the USSR armed services, military districts (fronts), air defense districts, groups of forces, fleets, armies, flotillas, large units, and garrisons; and of military procurators equal to them.

The training and improvement of qualifications of officer personnel in the military procurator's office are done within the system of USSR Ministry of Defense military training institutes and the training institutes attached to the USSR procurator's office.

The appointment of officers, who do not have a complete higher legal education to the positions of military procurators and military procurator investigators is permitted only in individual cases and is done in the manner established by the USSR procurator general.

### Article 34. The performance of military service by servicemen in the military procurator's office.

The officers, warrant officers, sergeants, master sergeants, soldiers, and sailors of the military procurator's office are on active military duty, and the military regulations and propositions which define the procedure for performing military service are applicable to them.

The awarding of the military ranks of the junior and senior officer corps to servicemen of the military procurator's office is done in the manner established by the USSR law "On General Military Service" on the recommendation of the chief military procurator and the military procurators of the branches of the USSR armed services, military districts (fronts), air defense districts, groups of forces, and fleets.

The military ranks of generals are awarded to servicemen of the military procurator's office by decrees of the USSR Council of Minister on the joint recommendation of the USSR procurator general and USSR minister of defense.

The release from active military duty of officers of the military procurator's office is done in accordance with the USSR Law "On General Military Service" on the recommendation of the chief military procurator.

**Article 35. The commendation and responsibility of military procurators and investigators.**

Military procurators and the investigators of the military procurator's office are commended and bear disciplinary responsibility in accordance with the rules of the USSR armed forces Disciplinary Regulations.

Only higher military procurators, the chief military procurator and the USSR procurator general enjoy within the limits of their competency the right to command military procurators and the investigators of the military procurator's office and to impose on them disciplinary punishments for violations of military discipline and for service misdemeanors.

The bringing and investigation of criminal proceedings in regard to military procurators and the investigators of the military procurator's office are an exclusive competency of the procurator's office and are done with the agreement of the organ appointing these persons to the position.

**Article 36. Establishing the structure and staff of a military procurator's office.**

The personnel of military procurator offices and of the chief military procurator's office are included in the T/O strength of the USSR armed forces and are given all types of allowances on a level with the personnel of the troop units and establishments of the USSR Ministry of Defense.

The list of T/O positions for procurator and investigator workers of the military procurator offices and the military ranks corresponding to these positions are approved by the Presidium of the USSR Supreme Soviet on the joint recommendation of the USSR procurator general and USSR minister of defense.

The structure and staff of the chief military procurator's office are established by the USSR procurator general together with the USSR minister of defense, and that of lower military procurator offices -- by the chief military procurator together with the General Staff of the USSR Armed Forces.

The number of servicemen, workers and employees in the military procurator offices is correspondingly allotted to the account of the Soviet Army and Navy, border troops, internal troops, military construction detachments (units), and organizations.

**Article 37. The logistics support of military procurator offices.**

The logistics support; financing; furnishing of work premises, transport, and communications systems; and the storage of the archive material of military procurator offices have been placed on the corresponding establishment of the USSR Ministry of Defense.

Article 38. The guarding and escorting of detained and arrested persons.

The guarding, holding and escorting to military procurator offices of persons confined in troop and garrison guardhouses are done by the corresponding troop units or military komendatura of the garrisons.

The escorting of persons who are located in other places for holding detained and arrested persons as well as those in prisons and correctional labor colonies is done in the prescribed manner by units of the internal forces and the organs and establishments of the internal forces.

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## AIR FORCES

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## AIR FORCES

### KUTAKHOV STATEMENT ON AIR FORCES DAY

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 81 (signed to press 2 Jul 81)  
pp 1-3

[Article by Commander-in-Chief of the Air Forces, Hero of the Soviet Union Chief Mar Avn P. Kutakhov: "Guarding the Air Borders"]

[Text] Our motherland observes USSR Air Forces Day--a national holiday--in an atmosphere of elevated political and labor activity and the solid unity of the Soviet people and their soldiers around the Communist Party, its Leninist Central Committee and the Political Bureau of the CPSU Central Committee, headed by General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade Leonid Il'ich Brezhnev, a true Marxist-Leninist and an outstanding statesman and political figure of our times.

The robust energy, enthusiasm and will of the Soviet people are directed toward successfully realizing the historic resolutions of the 26th CPSU Congress. These resolutions, imbued with vivifying Leninist ideals, provide for the continuous reinforcement and development of the economic and defense might of the USSR, the further improvement of socialist social relations and the continued progress of our country toward communism.

The Soviet people inseparably link their revolutionary optimism and steadfast confidence in a future day with the home party and its guiding activity in all spheres of social life. Their hearts and thoughts are fused with the party of the communists which wholeheartedly serves the working people and follows an unwavering Leninist course. "We are optimists because we believe in our party, and we know that the path it shows us is the only true path!" These words from the Central Committee's Summary Report at the 26th CPSU Congress can be heard today in all languages and dialects of our multinational family.

A mighty economic potential has been created in our country through the efforts of the Leninist party and all of our people. Our country's defense strength has grown, and the Soviet peoples' material and cultural standard of living has increased steadily.

Standing in a rank of defenders of the Country of the Soviets are the Air Forces which began their heroic chronicle along with the birth of the socialist State.

They have made their way along a glorious combat path. The formation and development of the Air Forces is inseparably linked with the name of Vladimir Il'ich Lenin. The Bureau of Commissars of Aviation and Aeronautics was formed on his initiative on 10 November 1917. In January 1918 began the massive formation of the first aviation detachments, which marked the beginning of the Red Air Fleet. Among the first Soviet pilots were communists--people of a particular frame of mind, to the end dedicated to the revolution and the ideals of communism.

The crucible of civil war tempered the combat spirit, developed the flying skills and gave rise to the glorious combat traditions of the first generation of air warriors who successfully engaged Kolchak, distinguished themselves in battle with Denikin and defeated Wrangel. History has carefully preserved the names of our winged sons, selflessly devoted to the people and the party.

Because of the constant concern of the Communist Party, a mighty aviation industry was created in the years of the first five-year plans, talented scientists and designers were cultivated and flying and technical staffs were trained.

It was very significant that the Leninist Komsomol undertook to help the Air Forces in January 1931. Bold, young people, educated in the spirit of boundless dedication to communist ideals and loyalty to the party and the people, entered aviation. In an unprecedentedly short period of time, the Country of the Soviets became one of the world's leading air powers.

Obeying the patriotic call to fly higher, faster and farther than everyone else, Soviet pilots completed a number of outstanding flights in domestic aircraft during the prewar years, setting more than a third of the world aviation records. The heroic epopee of the rescue of the Chelyuskintsy in 1934 will always remain in the people's memory. Its participants, pilots A. Lyapidevskiy, S. Levanevskiy, V. Molokov, N. Kamanin, M. Slepnev, M. Vodop'yanov and I. Doronin, were the first in the country to be awarded the high title of Hero of the Soviet Union. In June 1937 the whole world followed with admiration the Chkalovskiy crew's remarkable overflights of the North Pole to America.

Carrying out their international duty, our volunteer pilots bravely fought in the skies over Spain, Mongolia and China. These winged heroes demonstrated courage and valor in battles with the Japanese Samurai near Lake Khasan and on the Khalkin-Gol River.

Of inestimable value was the contribution of our aviation toward the victory of the Soviet people over Fascist Germany. At all stages of the Great Patriotic War, not a single large-scale military operation was mounted without the active participation of the Air Forces which defeated Hitler's aviation and struck crushing blows at the enemy in fierce air combat in a united battle formation with fighting men of the army and navy. Soviet aviation successfully provided cover for the troops and industrial installations from air strikes and carried out air operations to destroy individual elements of the enemy's ground troops and aviation, performed reconnaissance, supported the combat operations of the partisans, destroyed the enemy's manpower and equipment and struck at military objectives in the rear area of Hitler's Germany. These soldier-aviators displayed high combat and moral and political qualities.

Their moral conviction, devotion to the Communist Party and the socialist motherland, Soviet patriotism, loyalty to military duty and hatred toward the enemy served as inexhaustible sources of fortitude and courage.

During the war years, Soviet pilots completed more than three million air sorties and destroyed more than 57,000 of Hitler's airplanes in air combat and in airfield strikes. This amounted to two-thirds of their losses on the Soviet-German Front. Alongside Air Force and PVO fighter aviation pilots, naval aviation flyers made a great contribution toward achieving victory over the enemy.

The feats of our remarkable engineers, technicians, young aviation specialists, communications experts and fighting men in the rear aviation services are great in the eyes of the motherland. Their day-to-day work at the front required tremendous effort, fortitude, courage and endurance. In cold and rain, at night and under the noonday sun, sometimes under fire, sometimes being bombed, they readied their aircraft for flight, quickly repaired damaged aircraft, equipped aviation units with everything necessary and often, with guns in hand, repulsed the attacks of enemy troops who had broken through to the airfield.

The Soviet aviation industry stood this severe test in a worthy manner. During the years of the Great Patriotic War, the Soviet aviation industry produced more than 108,000 combat aircraft and developed the mass production of 25 new types of aircraft.

The motherland sized up the feats of its winged defenders. For courage and valor, more than 200,000 aviators were presented with medals and awards. The title of Hero of the Soviet Union was conferred upon 2,420 pilots, while 65 of them were twice presented with the title. Mar Avn A. Pokryshkin and Col Gen Avn I. Kozhedub were three times awarded the title Hero of the Soviet Union. More than a third of the aviation formations and units were given the title of guards, and two-thirds received honorary titles. About 800 were awarded medals of the USSR.

"The Soviet people," said Comrade L. I. Brezhnev, "underwent grave tests never before experienced by any nation. They passed through fire and blood on an unprecedented scale of combat along their path to the great victory. Under the leadership of their Communist Party, the Soviet people carried on through the October conquest, crushed the aggressors and rid their land of the invaders. They destroyed fascism, the darkest offspring of imperialism." The Soviet people again showed the whole world that there are no forces on the face of the earth which can defeat a people freed from the yoke of capitalism; there are no forces which can destroy socialism, the social order created by the people.

The years will pass, but the magnitude of the immortal, heroic achievements of millions of Soviet people will never fade in mankind's memory. They went through more than 1,400 fiery days and nights on their way to the Great Victory. This fierce, bloody war took the lives of 20 million of our people. We will never forget this. The memory of this war is for us a call to constant vigilance regarding aggressive intentions against peace and socialism. Remembering this war means more than persistently strengthening the defense capabilities of our motherland and being in a constant state of combat readiness.

As a result, the Great Patriotic War was a formidable warning to today's reactionary forces and a severe lesson for all those who love military adventures.

Under the leadership of the Communist Party in the postwar years, our people performed the feat of reviving and rebuilding a national economy destroyed by war. A developed socialist society was built in our country. Our class brothers--the peoples in countries of socialist cooperation--are heading along this path. Actively working together within the framework of CEMA and the Warsaw Pact, they, together with the Soviet Union, are conducting the next battle against the threat of a new world war. They are struggling to strengthen peace in Europe and the other continents and to rally all anti-imperialist forces.

The 26th CPSU Congress has once again affirmed that the highest aim of the Soviet Union's international policy is peace. The complex of initiatives put forth by the congress has truly become a Program for Peace in the 1980's. Our party, its Leninist Central Committee and the Political Bureau headed by L. I. Brezhnev, a tireless champion of lasting peace and the aversion of thermonuclear catastrophe, contrast their proven doctrine of peace, peaceful coexistence and equality of States--great and small--with the imperialist doctrine of aggression and war. All the Soviet initiatives are imbued with a striving to overcome the present aggravation of international relations and to proceed farther along the path toward intensifying disarmament and adopting specific, practical measures to limit the arms race.

"We are not supporters of the arms race," said Comrade L. I. Brezhnev at ceremonies in Kiev. "We are its enemies. We could find entirely different applications for the resources which the arms race absorbs. If we have to, we will find a quick and effective reply to any challenge of belligerent imperialism, for our first, most sacred duty is to insure the safety of our country and its allies and to guarantee a reliable peace for the Soviet people."

Recently, the policies of the reactionary imperialist forces, primarily those of the United States, its NATO partners and their Chinese accomplices, have made an abrupt shift toward stimulating the arms race. The imperialist reaction is again attempting to aggravate the international situation and to return the relations between States to the times of the "cold war." The imperialists are developing various aggressive military-political doctrines directed against countries of socialist competition and continue their intensive material preparation for a new world war.

The imperialist States are trying to cover their military preparations with the myth of the "Soviet military threat." Under the smoke screen of this myth, they are drawing a line toward undermining disarmament efforts and achieving military superiority over the USSR and its allies. Toward this end, the NATO countries have already accumulated and continue to build and stockpile new types of weapons, including nuclear-missile weapons. These countries are guided by armies numbering millions of men whose training is carried out in an openly aggressive spirit. Toward this end, these nations have created a multitude of military bases around the countries of socialist cooperation. The number of these bases is constantly growing.

The offensive unleashed by international reactionaries against disarmament is accompanied by extensive propaganda campaigns based on antisovietism and anticomunism.

They use the basest means and methods, right up to actual falsification of the facts and ideological sabotage. Characteristic in this respect are the subversive actions of imperialism against Poland, aimed at destabilizing the situation in the country, discrediting the socialist order and weakening socialist cooperation.

The complex international situation reminds us that it is necessary to maintain elevated vigilance and be on the alert for the intrigues of the enemies of peace and socialism. Together with the soldiers of the fraternal armies, we must do everything so that the peaceful work and safety of the peoples of socialist cooperation will be reliably protected. We are obliged to do this because of the harsh lessons of the Great Patriotic War.

In this atmosphere of preserved military security, the Communist Party and the Soviet government are compelled to reinforce their world policies through intensified strengthening of our country's defense capabilities. Displaying loyalty to Lenin's legacy--to be on the alert and to protect the country's defense capabilities--they devote constant attention to increasing the combat potential of the Soviet Armed Forces--the firm alloying of their fine technical equipment, combat skills and indestructible moral spirit.

The combat strength and combat readiness of the Soviet Army and Navy have been elevated to a new qualitative level. Field, air and naval training and the tactical coordination of units and formations have increased. The educational role of the Armed Forces has been increased.

The Air Forces today, together with the other services and arms of the Armed Forces, are likewise capable of executing large-scale operational and strategic missions. The technical equipment of our aviation fully satisfies the interests of reliable defense of the air borders and the State interests of the motherland.

Soviet aviation is the cradle of cosmonautics. It has been 20 years since that remarkable day when citizen of the USSR Yuriy Alekseyevich Gagarin completed the world's first space flight. Since that time, our country has sent 50 Soviet cosmonauts into space. Nine international crews have successfully completed flights in the "Interkosmos" program on the Soviet "Soyuz" spacecraft and "Salyut-6" scientific station. These remarkable successes of domestic cosmonautics are an important contribution toward solving the tasks set by the 26th party congress with respect to the further study and development of space in the interests of science, technology and the economy.

In fulfilling the requirements of the 26th party congress and the instructions of the General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev regarding defense matters, the military councils, commanders, headquarters, political organs and Komsomol and party organizations are placing their main emphasis in their political and organizational work on having their personnel develop a thorough mastery of complex aviation systems, on developing the most effective combat and technical methods and on training pilots, navigators and crews for bold and decisive actions in modern combat.

These soldier-aviators always remember the instructions of USSR Minister of Defense, Marshal of the Soviet Union D. F. Ustinov: "Combat readiness is the alloying of combat troops' equipment, their military training, moral-political, psychological and physical conditioning and the organization and readiness of each Soviet soldier to perform great feats in the name of fulfilling his duty before the motherland."

Improving combat readiness demands the tireless reinforcement of the military-technical and political skills of Air Force personnel. It also demands that they be perfectly skilled in using the complex equipment and the methods for its combat application. It requires an intensification of the struggle to achieve a high degree of effectiveness and quality in combat and political training. The more effective combat training is, the higher its quality and final results, the better the combat readiness of the Air Forces will be.

While improving the combat training of pilots, we must concern ourselves not only with the excellent training of the individual airman or ground-based aviation specialist, but also with the high level of combat cooperation in each crew, flight, squadron and other fighting units. The dialectics of development of our aviation are such that the Air Forces are more and more being equipped with weapons intended for collective use whose application requires exceptionally rapid, coordinated actions on the part of personnel.

During the training process, it is very important to make an effort so that all categories of personnel thoroughly understand and strictly observe the laws of flight service, the rules for operating and servicing aviation equipment and the organization and direction of the flights. It is necessary to constantly improve the flight-instruction skills of the commanders and the level of technical and special training given the aviators. Based upon this and the high degree of personal responsibility, organization and discipline, we also have to insure flight safety.

An important role in the further improvement of combat training in Air Force units belongs to party political work. Its primary task is to educate Soviet airmen in the spirit of selfless service to the motherland, Soviet patriotism and socialist internationalism. At the center of attention must be a thorough study of Marxist-Leninist theory, the rich ideological and theoretical legacy of the great Lenin, the historic resolutions of the 26th CPSU Congress, the internal and external policies of our party, the resolutions of its Central Committee and the works of Comrade L. I. Brezhnev, other party leaders and the Soviet government.

The constant realization of the requirements in the CPSU Central Committee's resolution "On the Further Improvement of Ideological and Political Educational Work" regarding the strengthening of the educational role of the Armed Forces is of particular importance in party political work at this present stage.

The resolutions of the 26th CPSU Congress and the resolution of the CPSU Central Committee, the USSR Council of Ministers, the All-Union Central Trade Union Council and the Komsomol Central Committee "On All-Union Socialist Competition for the Successful Execution and Overfulfillment of the Tasks of the 11th Five-Year Plan" serve as a program of practical activity for airmen in the struggle for high effectiveness and quality in military work, for perfection of their flight skills, for increasing vigilance and for strengthening military discipline.

Socialist competition under the motto "For High Combat Readiness and Unwavering Military Order" is an important factor in further improving combat and political training. Personnel from a Red Banner guards bomber aviation regiment commanded by Guards Col V. Rodionov are the initiators of this competition in the Air Forces.

In carrying out the obligations they have assumed, many military collectives have achieved new successes in air training, in improving combat readiness and in reinforcing military discipline. Officer-instructors V. Sadikov, N. Sinyukov, V. Zhavoronkov, V. Baskakov, V. Archegov, Yu. Vladykin and others are doing creative work. In a comprehensive manner and with an eye to the future, they are approaching a solution to the problem of improving the effectiveness and quality of personnel training. They are establishing the training process on a scientific basis.

The Communist Party and the Soviet government place a high value on the military work of the aviators. Many progressive aviation commanders, political workers, pilots, navigators, engineers and technicians have been recognized with State awards. The best officers have been awarded the honorary titles "Honored Military Pilot of the USSR" and "Honored Military Navigator of the USSR."

All of the airmen's activities have now been subordinated to executing the tasks set by the party and to reliably defending the achievements of socialism and communism. Examining their military work as a component of the public struggle to realize the historic resolutions of the 26th party congress, they concentrate their attention on further improving the qualitative indicators of combat and political training and on increasing combat readiness.

The airmen greet USSR Air Forces Day with new successes in combat and political training. A high degree of political development and a business-like mood are what now characterize life in our Air Forces. These airmen--loyal sons of the Soviet people--like all other fighting men in the Armed Forces who are inspired by the historic resolutions of the 26th CPSU Congress, are doing everything necessary to increase their combat readiness and vigilance and to improve their combat skills. On the first call from the Communist Party or order from the motherland, they are prepared to carry out to the end their patriotic and internationalist duty to defend their fatherland, the business of peace and socialism.

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## AIR FORCES

### PARTY INFLUENCE ON TRAINING RESULTS DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 81 (signed to press 2 Jul 81)  
pp 8-9

[Article by Lt Gen Avn I. Zhabin: "Effectiveness of Party Influence"]

[Text] I had occasion to be a delegate to the 26th CPSU Congress, an event which left an indelible impression on my consciousness. A communist sense of ideals and the party's regard for principle, a business-like approach and specific purpose, a scientific approach to the solution of assigned problems, a feeling of goodwill and an even, business-like rhythm--these are what characterized the work of the congress.

From this point of view, it seems necessary to discuss as well the practical activities of the aviation unit party organizations in the okrug and the effectiveness of their party influence upon resolving the problems of combat and political training confronting their personnel.

I have long remembered the open party meeting in the Guards fighter aviation regiment, where Maj Yu. Mazur was the Guards party committee secretary. The members of this meeting seriously discussed the realization of plans made at the 26th party congress. The results of a high-level forum of Soviet communists caused much hesitation among the people and left their impression on the ideological life and practical affairs of the military collective. The achievements of the aviators in combat training, in service and in socialist competition were discussed in a business-like manner in the report of the chief of the political section and the speeches of the communists. They also disclosed the reasons for individual cases of negligence and planned methods for preventing them. Not a bit of conceit nor self-satisfaction over the successes achieved was sensed.

These successes, by the way, have been considerable in recent years. During the precongress socialist competition, the squadron headed by party committee member and military pilot 1st class Guards Col V. Lavrinov and the technical maintenance unit led by chief of the Guards Engr-Sr Lt A. Glazov have become outstanding. More than half of the unit's personnel are honors students in combat and political training, and 65 percent of them are communists. All the pilots have class ratings. These military pilots receive only marks of good or excellent in their classes. The unit has worked for six years without an accident. Major violations of military

discipline have been eliminated in the collective. The party committee and party organizations of the squadron and technical maintenance unit have performed great services in these successes.

In carrying out the requirements of the CPSU Central Committee's resolution "On the Further Improvement of Ideological and Political Educational Work," the regiment's party committee has done much to turn the party organizations into centers of daily ideological educational activity. The party organizations have succeeded in mobilizing the aviators for an intense struggle to fulfill their socialist obligations and to support the progressive role of the communists in combat and political training. At the party meeting, however, where these issues were discussed, the communists spoke little about their successes. Basically, they evaluated the things that they had achieved, focusing the major part of their attention on unresolved matters.

The party committee secretary's speech was critical. The business-like conduct of the meeting and the concerned, mature opinions of the communists indicated that the squadron and unit party organization can do much to achieve good results if it is managed skilfully and if the energy, skill and experience of party members and candidates for party membership are directed toward the creative solution of the tasks which have been set.

In this connection, I would like to emphasize that V. I. Lenin turned his attention to the role of lower-level communist units when Bolshevism was just dawning. A recurrent theme in many of Lenin's works is the fact that party cells are the foundation upon which the entire party structure is built. The leader of the revolution saw in these cells the strong points for the party's propaganda and organizational work among the masses.

In his report to the 26th party congress, General Secretary of the CPSU Central Committee L. I. Brezhnev emphasized with new vigor that the primary role in solving the great and various tasks of communist construction belongs to the local party organizations.

In realizing these instructions, the party committee directs its efforts first of all toward improving ideological work and increasing the organizational activity of party organizations and toward enhancing the effect of these organizations on all aspects of life and combat training. Together with the commander and his deputy for the political section, the party activists try to make sure that the major portion of mass political measures are undertaken in the squadrons and units. At the same time, the party committee persistently increases the influence of party organizations in units and party groups on increasing the communists' activity in sociopolitical life and on insuring their leading role in service and in strengthening executive discipline, order and organization. Particular attention is devoted to improving flight training and the tactical training of flight personnel and to insuring flight safety. During tactical flying exercises, during flights and in the days of preliminary preparation, party activists purposefully conduct party political work and skilfully mobilize people to carry out the tasks confronting them.

Members of a party committee led by their secretary recently worked for two weeks in the squadron where Guards Maj N. Pravuk is the commander and Guards Sr Lt A. Korkach is the party organization secretary. They conducted an in-depth analysis

of the work being done to improve the sociopolitical activity of the communists. They found shortcomings. It turned out that the aviators, members of the Lenin Room Council and secretaries of the units' party organizations have not been working here at full strength. Individual unit commanders and group chiefs did not rely enough on the lower-level party organizations and did not direct their activities as required by the Instructions for CPSU Organizations in the Army and Navy. For example, a unit commander, communist V. Batsayev, did not once during the course of the year deliver a report to the party organization in the unit he commanded. Certain officers did little to increase their own ideological and theoretical levels and, in most cases, kept silent at seminars of Marxist-Leninist training groups. In the final tally, this had a negative effect on the aviators' service activities. The party committee members then took part in carrying out the solution adopted. The party actives had individual discussions with those officers and warrant officers who were passive in sociopolitical life and who allowed deviations from the legal requirements of military service. The party bureau listened to the reports of certain communists on improving their ideological-theoretical level. Moreover, they conducted interviews and discussed articles on daily issues published in periodicals. All the communists received party assignments. The measures adopted helped to raise their sense of responsibility for carrying out the duties of a CPSU member and for participating in day-to-day ideological educational work. The output of the local-level party actives engaged in propaganda work grew considerably.

In his report to the 26th party congress, Comrade L. I. Brezhnev told of the gratitude of an enormous army of people who bring the party's ideas to the masses and who explain its policies. "They are," he said, "the lecturers and propagandists, the aviators and speakers. Their work, as a rule, is performed on a voluntary basis at the expense of their own free time. What they do is useful and necessary for the people. We thank them very much!" Chief of the Guards group Capt K. Smirnov and commanders of Guards crews Sr Lt A. Filippov and Sr Lt M. Kondratenko thoroughly studied materials from the 26th party congress and now regularly present lectures and reports to the personnel. Members of the Lenin Room Council, editorial boards of wall newspapers and editors of military leaflets also held conversations with soldiers and sergeants, and published wall newspapers and military leaflets devoted to the high-level communist forum.

The party committee made the administrative work of the unit party organizations considerably more lively. The committee began teaching the party actives more specific methods for a political approach to solving combat training problems and began to stimulate the activity of communists and Komsomol members in socialist competition. On the committee's initiative, the gaps in the party's work uncovered in the Guards squadron of Maj Pravuk were discussed at the next seminar of secretaries of unit party organizations. Classes are now regularly held with unit commanders and group chiefs in which they analyze questions regarding the training of their subordinates and are provided with recommendations on how they can best be guided by party organizations and groups in their own activities.

The party committee in this unit has accomplished much that is positive in the supervision of party organizations. A creative approach to business is more and more often being asserted in the style of its operation.

Is the party committee in the neighboring unit likewise working in the same direction? Unfortunately not. It has come down to this. The pilots of both regiments were conducting bombing and strafing runs at the range. Aviators from the unit where Maj. Yu. Mazur was the secretary of the Guards party committee worked skillfully, were tactically competent and made heavy strikes against the assigned targets. Some pilots from the other regiment, however, were not in a combat frame of mind. Initiative was lacking, and the attacks all looked alike. Among those lagging behind were party activists, officers A. Alyasin and V. Osipenko.

This annoying error was not accidental. This unit did not insure a rhythmic flow in flight operations, nor was the necessary degree of party concern displayed regarding the tactical and firing training of the aviators and the summation and dissemination of the experience of air combat experts. We must also mention the insufficient effectiveness of party influence upon a high-quality solution to the primary missions. The party committee, of which Capt A. Lyapin is a member, was not specific in its management of the units' party organizations, nor did it improve their level of activity. There were no shortcomings in the party measures here. The problem, however, was that the measures were being carried out at a low level and did not exert the necessary influence on the state of affairs. Many times the party committee worked in the party organizations of the squadrons and units, uncovered deficiencies and adopted corresponding solutions. They just remained on paper, however, since energetic organizational work to realize those solutions was not sustained.

The education and training of active party members was also not on the necessary level. For the most part, seminars were replaced with brief periods of instruction. Forms of individual instruction such as the direct on-site training of unit party organization secretaries were not employed.

During examination of the situation in the units, serious criticism was leveled at the work of the party organization in the unit where Maj Drugoveyko is the commander and Sr Lt V. Novogurskiy is the secretary of the party organization. In this unit, little attention was devoted to political training, and the communists had a passive attitude toward sociopolitical work. Instead of being more occupied with the individual training of the people, some party actives focused on mass measures on a unit scale. Ideological work was conducted in fits and starts. For this reason, the squadron lagged behind others in combat and political training, and violations of military discipline were common.

The 26th CPSU Congress emphasized its intolerance of similar occurrences in ideological work in a most pointed manner. From these standpoints, the communists also analyzed their activities, disclosed deficiencies and determined methods for eliminating them. Positive moves were planned, political workers and party activists still have much to do in order that party organizations can really become centers of daily ideological and educational activity.

The party committees' operational practice in managing party organizations and the summation and dissemination of their progressive experience is at the center of attention of our political section. We periodically listen to the chiefs of political organs and party committee secretaries regarding the implementation of the resolutions of the 26th CPSU Congress and the party's Central Committee and

the directives of the USSR Ministry of Defense and the head of the Chief Political Administration of the Soviet Army and Navy. These issues are discussed at seminars and meetings of party actives. For example, the political section rendered aid to political organs and party committees in carrying out the party's requirements for turning local party organizations into centers of ideological educational activities. These requirements were presented in the resolution of the CPSU Central Committee, "On the Further Improvement of Ideological and Political Educational Work." Practical recommendations are prepared and sent to party organizations.

There are no words to describe how much the political organs have done to improve the party's work in all units. It must be recognized, however, that we have definite gaps in this work. At times we do not finish what we have begun. For example, the officers of our political section worked many times in A. Lyapin's party committee and pointed out deficiencies to the secretary. However, they gave him little concrete help.

In a report at a ceremonial session dedicated to the 111th anniversary of the birth of V. I. Lenin, it was emphasized that the active role of each bureau member or party committee member should be perceived in all electoral party organs. It is in this joint cooperation that the best solutions can be found. The authority of a leader of any rank only increases when he is able to listen to differing points of view, even if they do not coincide with his own. From this standpoint, we are arranging work with party activists. We send them to Marxist-Leninist universities and party schools, and we strive to devote more attention to organizational and educational work during combat training, during tactical flight exercises and while flying.

Practice shows that our perception of party organizations as the true centers of day-to-day ideological educational activity is suffused with practical content when party activists are indeed the true leaders of the masses and when communists keep an eye on how the military collective is getting along and what disturbs it.

We are taking every measure so that each local party organization will be an efficient, well-ordered military collective and will influence the high-quality solutions to the critical tasks imposed by the 26th CPSU Congress.

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## AIR FORCES

### INTERCEPTOR TRAINING WITH RADIO-CONTROLLED TARGET DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 81 (signed to press 2 Jul 81)  
pp 12-13

[Article by Capt A. Podolyan: "Prudently, Boldly and With Initiative"]

[Text] The pair of fighters crossed the boundary of the firing area. The coastline below could be seen distinctly. The pilots had to engage the aerial "enemy" in this region.

Flight leader Capt A. Kruglov, military pilot first class, carefully studied the situation. Sr Lt S. Anchikov, following behind him at the assigned interval and distance, was also on the lookout. It had become the rule in the regiment: junior pilots flew with their immediate commander, an experienced airman, when carrying out the most challenging missions. That was the case this time.

A few days ago Anchikov had been awarded his next military rank. Now he had to demonstrate his shooting skill and tactical training and carry out the launch of a combat missile against a radio-controlled target. The officer did not doubt his capabilities; nevertheless, the feeling of anxious expectation did not leave him. All the same, it was his first combat fire mission.

The orders were not forthcoming from the command post, but experience acquired during years of flying told Capt Kruglov that the target was approaching the range area. Indeed, a few seconds later, the voice of the officer at the tactical control post could be heard in the earphones:

"Two-twenty, turn left onto the course..."

The fighters executed the command precisely.

"The target is ahead of you and higher, distance..." the navigator informed the pilots.

"Roger," answered Kruglov. He ordered, "Ready!"

The wingman assumed the battle formation specified for attack.

The screen of the onboard radar sight was illuminated with a greenish light. The

target, meanwhile, was not visible. Having engaged the weapons switches, Capt Kruglov began the search and after 10 seconds detected a blip in the left corner of the indicator.

"I see the target!" he reported to the command post.

"You have permission to work!" was the reply he heard.

The leader turned his fighter and lined up the blip from the target aircraft with the zero azimuth. After a few seconds the electronic firefly suddenly began to shift sharply to the right, then again to the left. Banking his machine vigorously from side to side, Kruglov repeated the target's maneuvers. The distance was quickly reduced. The leader glanced ahead for a second and managed to catch sight of a reflection from the sun as it flashed and vanished far in the distance along the same course. The target was turning.

Lock-on! Now the "enemy" could not get away. Keeping the bird in the center of the ring, Capt Kruglov turned his fighter to the right, and at that moment radio communications ceased. In the next second the "launch" signal lit up. The pilot pressed the firing button but the missile did not leave. Checking quickly to see whether all the switches were engaged, the captain pressed the firing button again. The launch did not follow.

Sr Lt Anchikov closely followed the flight leader's actions and carried out his commands with precision. Having acquired and locked onto the target, he kept the bird a little to the left and above the sight ring and made ready to launch just as soon as Kruglov pulled out of his attack run. Here was the flight leader in the line of fire, but for some reason he was delaying the launch. The missile was still under his wing. What was the matter? What was he, the wingman, to do? The target was drawing closer and closer. Anchikov queried the flight leader. The reply, however, did not follow. Kruglov's aircraft suddenly banked sharply and pulled out to the left. Should he follow? The target, then, would remain undamaged.

The thought came clearly and distinctly: attack! He turned to the left and climbed. The bird was in the center of the ring. Launch! The missile tore away from below the wing. There was no time to follow its flight. Anchikov turned hard left. Off to the side, breaking into pieces, the radio-controlled target swept past. The attack proved to be accurate.

When Sr Lt Anchikov formed up with the leader, Capt Kruglov pointed to his earphones. Anchikov understood: radio communications had gone out on the fighter. Reporting to the ground what had happened, Anchikov moved up ahead and assumed a course for the airfield. The pair completed the flight safely.

On the ground it was determined that one of the specialists, while carrying out work on the leader's aircraft, had poorly joined the electric power-supply connector and had not locked it. When subjected to G-forces and vibration, the connector came apart. As a result, the weapons system and the radio lost power. The persons responsible for the accident were reprimanded. The commander explained to the aviators in detail what such negligence on the part of a maintenance specialist could lead to in an actual combat situation.

At the same time, he pointed out the skilful and precise actions of the pair's wingman, Sr Lt Anchikov, which showed initiative. Thanks to him, the vital flight mission was executed, and the squadron did not lose points in the determination of the overall fire evaluation.

Initiative, resourcefulness and self-dependence--these qualities have particular importance for the airman. In the rapidly changing environment of modern combat, only a well-trained pilot, confident of his powers and cognizant of the combat capabilities of the equipment he is operating, can evaluate the situation in a fraction of a second and make a competent and uniquely correct decision. Capt A. Kruglov and Sr Lt Anchikov demonstrated a high level of tactical training and the capability to exchange roles in a critical air-combat situation. In the situation that had arisen, Anchikov had no time to get additional instructions from the ground. He had to make the decision to attack the target independently. In single combat with the navigator guiding the target, the pilot emerged victorious.

The experience of the Great Patriotic War points to the fact that it is extremely important for a pilot to possess the skill to orient himself quickly in the dynamics of combat, to guess the enemy's intent and impose his will on the enemy. The skill does not come all of a sudden. One must possess excellent knowledge of tactical methods, have sound flight training and cultivate within oneself the willingness to take immediate action when the situation becomes complicated. This is aided by purposeful studies and training, during the course of which from the very start the young pilot accustoms himself to independent work and realizes the necessity of improving his piloting and tactical skills. It is also aided by pilot critiques and by conversations between experienced airmen and young people.

Capt Kruglov, while discussing various methods of aerial engagement with his subordinates, always tries to develop within these subordinates their independence and initiative. He prepares his wingman in advance for decisive action at any stage of single combat with the "enemy." The flight commander devotes great attention to the work the pilot performs with sighting systems and weaponry. This is understandable. The time interval from the moment the target is acquired to the moment the firing button is pressed is not very long. Precision operation of the tumblers and switches in the closing seconds of single combat acquires particular significance.

Anchikov spent many hours in the cockpit of the fighter and in the simulator before he began to operate the weapons system accurately. The commander demanded that Anchikov locate the necessary switches and make the manipulations needed without taking his eyes off the target. He required that Anchikov have a clear-cut picture of what would take place after this or that action. In other words, the pilot makes each movement in the cockpit an intelligent, regulated automatic action through hundreds of repetitions.

As practice shows, competent actions showing initiative on the part of the pilot not only contribute to the successful execution of missions in the air but also actively influence the development and course of combat operations on the ground. I will cite an example.

Maj V. Krivosheyev's flight was ordered to cover a crossing in the southern sector of the "front." It would not be out of place to say that the crossing was of vital

importance to the advancing troops, since two pontoon bridges brought downstream were "destroyed." The situation required that new units be brought into the battle immediately.

At the designated time, a group of four fighters appeared over the crossing. Maneuvering in the air-alert zone, the pilots looked over the airspace closely. Suddenly, the flight commander noticed a pair of fighter-bombers approaching the crossing from the north at medium altitude.

"If they nose down into a left turn, they will come out right on the pontoons," he thought.

"Afterburner! Attack!" commanded Maj Krivosheyev, as he put his fighter into a combat turn.

The pilots in the flight swooped in after him. Sr Lt K. Okhrimenko, wingman of the second pair, began his maneuver, simultaneously switching on the sight and the armaments for a missile attack. A brilliant glint of sunlight, however, made him look round. Over the hills below him, to the left and behind, another pair of "enemy" fighters were turning to attack the bridge, light flashing off their cockpit canopies. What should he do? Should he wait for the leader's decision? However, while he would search for the fighter-bombers and begin a maneuver, he would spend the time the "enemy" would use for the strike.

Okhrimenko made a decision. Putting his machine into a half-turn, he reported on the radio the appearance of a new group of "enemy" planes. On the downside portion of his trajectory, the pilot engaged his weapons for cannon fire. As he came out of his dive, he first registered the enemy wingman's aircraft and then the leader's aircraft in the aiming reticule. The gun cameras recorded a precise hit.

Was Sr Lt Okhrimenko taking a risk when he left the flight's combat formation and attacked independently? Of course he took a risk! At the same time he knew full well that the loss of precious seconds would inevitably lead to the destruction of the crossing and, subsequently, to the failure of the combat mission with respect to the air cover. He did not doubt that his comrades would help him in case it became necessary. It must be said that the pilots simulated their actions in a different air and tactical environment during their training. In this case, the flight commander devoted much attention to search operations and to decisive actions which display initiative in accordance with the unfolding situation.

Having obtained the information from Sr Lt Okhrimenko, Maj Krivosheyev immediately ordered the leader of the second pair to cover his attack. Together with his wingman, Krivosheyev himself attacked the upper pair. As a result, the feinting and attacking pairs of "enemy" aircraft were destroyed. The pilots of the attacking pair noticed Okhrimenko's aircraft when he had already broken off the attack. On approach to the crossing, they saw that the covering flight was swooping down on the feinting group and they calmly maneuvered to strike the pontoons.

The flight led by Maj Krivosheyev coped very well with the assigned mission. The motorized infantry and tank units which had crossed to the other bank of the river entered the battle with a rush and won it. Thus Sr Lt Okhrimenko's initiative actions rendered considerable help to the ground troops.

Offensive action, prudence and bold and decisive operations comprise the essence of fighter-pilot combat training. Serious attention is given to fostering these qualities among aviators in the unit where the officers we spoke about are serving. Experienced commanders try to develop in their young airmen the ability to correctly assess the situation taking shape, to take competent measures and to act with initiative. In this lies a sound foundation for improving combat readiness and the skill to win.

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## AIR FORCES

### AIR RESCUE TRAINING DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 81 (signed to press 2 Jul 81)  
pp 22-23

[Article by Lt Gen Avn S. Mosiyenko: "At the Distress Signal"]

[Text] Ten minutes before the take-off of the weather reconnaissance flight, the crew of an MI-8 search-and-rescue helicopter commanded by military pilot first class Capt Ye. Vakanov went on alert. A paraborne group was on watch together with the crew. Also on alert was a ground search-and-rescue crew. Their all-terrain vehicle with search-and-rescue service emblems on the canopy was located on a special parking area.

Flight Control Officer E. Solov'yev checked to see that the men and equipment were ready for search-and rescue operations and made the corresponding entry in the log.

The flights commenced. The heavy aircraft departed for the sky one after another. The pilot personnel were carrying out various missions. Everything was going according to plan.

The crew of military pilot first class V. Gulimov was concluding a multihour flight along their route. An emergency situation suddenly arose onboard the aircraft. With every passing second the situation became more complicated. The crew's struggle to save the flying machine did not produce the desired results. Soon Capt Gulimov reported to the flight control officer that the situation had become threatening and to continue the flight further was impossible. Officer Solov'yev immediately gave the command: "Abandon the airplane!"

Having thrown the onboard switch for automatic transmission of the distress signal, the crew jumped from the aircraft with parachutes. At a set altitude, miniature CO<sub>2</sub> cartridges built into the parachutes inflated the shells of the automatic radio-beacons, and the transmission of distress signals began right at that stage of the descent.

The automatic radio beacon operator, Pvt S. Irfanov, discerned the alarm data, took the bearing of the radio beacons and reported it to the flight control officer. This bearing was immediately transmitted to the command post. The command post crew immediately began ascertaining the probable search area.

The radio equipment needed to locate the distress victims and direct the searching was turned on at Flight Control Officer Solov'yev's order. Then came the command:

"Duty crew--make ready!"

The helicopter crew quickly took their places in the cockpit of the rotary-wing craft. A paraborne group consisting of three men stirred about under the lights in the cargo compartment.

The crew of Capt Ye. Vakanov is trained to render aid to distress victims day and night, under VFR and IFR conditions. The experienced airmen know the flight area well and are able to select landing areas from the air and set down on them. Many times during training they successfully carried out missions in wooded mountainous terrain. And here was a new, complex test.

Having reported to the controller that he was ready for takeoff, Capt Vakanov lifted his rotary-wing craft into the air and headed for the search area. The radio search equipment on the helicopter was operating, and the crew periodically interrogated the distress victims at one or two-minute intervals. Approximately 15 to 20 kilometers from the reference point, Vakanov received the crew's report on the health status of the victims and the results of the landing. This information was immediately transmitted to Flight Control Officer Solov'yev. Having commanded the distress victims to switch the radio to the "Beacon" mode, Capt Vakanov continued flying using the VHF-radiocompass.

The radio report arrived from the ground:

"We see you 200 meters to the left of us."

"Mark your position," replied Vakanov.

On the ground, a signal cartridge lit up immediately. Its orange smoke could be seen from far off. Having located the distress victims and ascertaining that they had landed in a forest, Vakanov brought the ground search-and-rescue team into the area.

The flight controller sent up the duty helicopter and gave the command to take off to the crews of military pilot first class V. Vetokhin and military pilot first class Major V. Okhotin. An emergency medical-aid team led by Maj Med Serv N. Lyut was onboard the helicopter.

The aircraft flown by Capt Vetokhin began circling in the search area. The crew relayed radio communications among the search controller, the search-and-rescue helicopters, the ground search-and-rescue teams and the crew of distress victims. This time Capt Ye. Vakanov took two men on board the helicopter and evacuated them to the airfield.

Maj Okhotin brought his helicopter into the search zone and landed on a site not far from the place where two members of the crew which had abandoned the aircraft still remained. They needed medical aid. Having prepared the injured for evacuation, the doctors put them on stretchers in the cargo compartment. The helicopter left for an airfield located near the hospital. The ground search-and-rescue team, led by Capt A. Belichenko, carried out the remaining crew members in their vehicle.

The search-and-rescue operation was successfully concluded. Little time had been spent on it. The officer in charge of the search thanked the participants and gave the all clear.

We can now tell you that there had not really been a crash. Everything that we talked about had developed during one of the training exercises of the search-and-rescue service. Representatives of the paraborne service, Masters of Sport of the USSR Maj V. Chernyshov and Lt V. Arfenov; warrant officers V. Frolov and V. Valyunas; and Sgt V. Bushina acted out the roles of the crew members who had suffered the accident. They all know their business well and are trained to jump with parachutes day or night on ground, water, forests and mountains. The majority of them belong to paraborne groups and are prepared to render any kind of assistance to a flight crew in case it becomes necessary. The concept of the training was developed and implemented by officer G. Konev, one of the most experienced instructors in the search-and-rescue service, who had done much to improve it.

Such training exercises are conducted periodically in Air Force units. They contribute to the further improvement of the search-and-rescue services provided for the flights. In aviation, these services are taken to mean the entire complex of measures carried out in the interests of timely search operations, the rendering of aid to crews and passengers of crashed airplanes and helicopters and their evacuation. It includes the alert status of search-and-rescue personnel and their flight-control facilities; the improvement of methods for broadcasting and receiving distress signals; the notification of search-and-rescue service agencies when an aircraft gets into a critical situation; the execution of search-and-rescue operations; the provision of group and individual emergency rescue equipment to the crews; the special training of all flight personnel in the actions to be taken in case of emergency escape from an aircraft and its ditching over land (or water); and, finally, the training of flight personnel in the execution of search-and-rescue operations. An underestimation of even a single element in the complex could lead to serious consequences.

Special airplanes and helicopters of Aeroflot and the USSR Air Force have been put on 24-hour alert in order to provide search-and-rescue services for crews and passengers of crashed aircraft. In addition to conventional radio equipment, they have equipment designed to locate people who have gotten into trouble. They also have kits of the equipment they need, prepared for air-drop. The helicopters, moreover, are equipped with winches and accessories for lifting a man while hovering over land or water. On alert along with these crews are paraborne groups ready for immediate and effective actions under the most varied conditions. Search-and-rescue operations in conjunction with aviation facilities (or, if necessary, independently) are conducted by ground search-and-rescue teams in Air Force units. They are also on alert and are provided with transport vehicles well-suited for cross-country travel, radio-communications gear and equipment for rendering aid. These units, like the paraborne groups, include doctors or medics. The reception of distress signals, the determination of the source's bearings and the use of radar to locate people in trouble is carried out with specially selected radioelectronic equipment. At the present time, a great many planes and helicopters throughout the country are on 24-hour alert for the purpose of search and rescue. Moreover, such aircraft are designated at all Air Force airfields during the period of time when their units are flying. Search-and-rescue personnel and equipment as well as command post crews must always be in a high state of readiness in order to render timely aid to those who need it.

The execution of search-and-rescue operations is a complex form of flight training. Each man understands, for example, that helicopter night landings on unfamiliar and uncharted sites, lifting a man on board from the water's surface or from the forest while hovering and low-altitude visual search operations demand a high degree of skill on the part of the crew. This is why only pilots with training levels higher than second class are permitted on alert.

No less important is the excellent training of those personnel attracted to operations of this type. Command post crews must develop their actions with respect to organization and control down to the smallest detail. They must have a profound understanding of the capabilities of the equipment they use and know how to utilize it skilfully. Practice shows that help arrives in the briefest period of time in those cases when the flight personnel, after escaping the aircraft with parachutes or making a forced landing, make competent use of the regular distress-signal equipment, particularly the individual or group emergency-rescue radios. In many ways, success is determined by the crew's skill in using the survival kit and in enduring extreme conditions. Conversely, any mistake complicates the search, leads to a loss of time and makes it necessary to involve a large detail of helicopters, airplanes and people.

In preparing for action in an emergency situation, flight personnel must understand that only a radiotechnical search insures rapid detection of the accident victims. If it does not provide the desired results, however, a visual search is organized. In this case, the region is broken up into squares, and the helicopters search them carefully. Sectors are designated for each crew member and for the observers, in which they must carefully look over the terrain. If they do not manage to achieve their goal by means of a visual air search, particularly in wooded or mountainous terrain, the command post organizes a ground search. The crew and the observers thoroughly inspect those places where viewing from the air was difficult.

Examples of aid rendered to the population during natural disasters testify convincingly to the high skill level of the crews on search-and-rescue helicopters.

A report arrived on 20 April 1980 at one of the aviation command posts: a strong wind had carried about 300 amateur fishermen on the ice out into Lake Ladoga. Air reconnaissance confirmed this. In order to rescue these people, six helicopters were enlisted which evacuated everyone in five hours. The crews of Maj V. Oliferenko, Maj V. Sergiyenko, Capt A. Turkin, Capt A. Nuzhdin, Capt V. Martynov and Capt I. Tsukanov performed skilfully. The troop commander of the Leningrad Order of Lenin Military District then encouraged all the airmen.

This past winter, an ice jam formed on the Daugava River near Yekabpils. The water level quickly began to rise. The city streets and the shore settlements began flooding. The duty search-and-rescue helicopter, piloted by flight commander and military pilot first class Capt O. Vetrov, was sent into the disaster area. The crew flew day and night. They evacuated 81 persons from the area in three days.

A new jam appeared on the Daugava on 31 March. Officer Vetrov was again sent to the people's aid. In three days, the helicopters took out more than 150 people. Pilot-navigator Sr Lt A. Shevchenko and flight technician Sr Lt Tech Serv G. Ignatov carried out well-coordinated work.

These examples already speak eloquently of how an elevated sense of responsibility for one's assigned duties and professional mastery are inherent characteristics of those flight personnel enlisted for search-and-rescue operations.

Air Force units do a great deal of flying. Despite the high reliability of aviation equipment and the great skill of flight personnel, it is nevertheless possible that extreme situations may arise in which the crew will be forced to escape the airplane (or helicopter) or land outside the airfield. For this reason, reliable search-and-rescue support of flight operations must constantly be a matter of general concern for the officer controllers, party and Komsomol organizations and the military community. The chief role in its organization, however, belongs to the aviation commander. In many respects, the success of this depends upon his mastery of training techniques and his ability to organize, his experience and his skill in bringing together and mobilizing people. The commander himself must first of all have a clear-cut idea of how to organize search-and-rescue support, know the capabilities of and procedures for utilizing the technical aids needed for the search and for rendering aid to distress victims and systematically educate and train his subordinates.

In other words, a great deal of purposeful work is needed. No efforts can be spared in this. Good organization of search-and-rescue support increases the flight personnel's faith in the fact that necessary aid will be rendered in a timely fashion if the flight situation becomes complicated and they are compelled to abandon the plane or make a forced landing. This creates a good psychological mood and makes it possible to give greater attention and efforts to superior execution of the assigned mission. As a result, the combat readiness of aviation units is strengthened and the safety of flight operations is enhanced.

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## AIR FORCES

### ENGINEERING TECHNICAL SERVICES: RATING IMPROVEMENT DISCUSSED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 81 (signed to press 2 Jul 81)  
pp 28-29

[Article by Engr-Maj Gen Yu. Voytsekhovskiy: The High-Level Rating is Not an End in Itself"]

[Text] With great satisfaction and pride in the homeland of the Great October and the glorious Communist Party, specialists from the engineer aviation service in our okrug welcomed the grand and impressive program for the new stage of communist construction presented in the Summary Report to the 26th CPSU Congress and in other documents from the high-level party forum of the Country of the Soviets.

During the year of the 26th CPSU Congress, the soldier aviators weighed their responsibilities and planned greater gains for further improving their combat training and enhancing their ideological tempering.

The training of rated specialists occupies an important place in the activities of engineer aviation services personnel. The work experience of one collective in which the engineer aviation service is headed by officer B. Ivanov is particularly deserving of attention. Here the majority of technicians and officers in charge of the technical maintenance sections and groups have high qualification ratings. This made it possible for them to master new aviation equipment in a short period of time and helped them to operate it competently. By rights, specialist 1st class Sr Lt Tech Serv N. Prigora enjoys a high degree of authority among the aviators. The words "Outstanding Unit Aircraft" are painted on the fuselage of the fighter he services. This outstanding officer unremittingly improves his professional skills and takes correspondence classes from the Kiev Higher Military Aviation Engineering School. Communist Prigora was recently awarded a diploma by the Komsomol Central Committee for the successes he has achieved in combat and political training.

How can the higher-class specialists be better and more rapidly prepared, and how can their training and the preparation they need to pass examinations for advancement to a new rating be organized most efficiently? These questions are at the center of attention for the commander, his engineer aviation service deputy and the party and Komsomol organizations. Understanding full well the importance of class ratings during the assimilation of new equipment, they constantly seek to improve methods for training and educating the specialists. They are also interested in the specialists' training and their independent study, and they actively disseminate the achievements of the best specialists.

Experience points out the fact that the presence of a strong nucleus of genuine experts in the unit--first-class specialists and masters--is a reliable guarantee that the combat equipment will be maintained in a high degree of flight readiness. The effort to raise the rating qualification is not an end in itself. It supposes first of all the striving on the part of the aviators to constantly improve their knowledge and to acquire the lasting skills necessary for the operation of modern aircraft and helicopters. Communists and Komsomol members, as always, are an example of this.

At one time, for example, Warrant Officer S. Kiryukhin was assigned to the position of combat aircraft technician in one of the units. He showed himself to be a conscientious specialist who diligently acquired experience in servicing the aircraft, persistently intensified his professional skills and studied much on his own. He inspires his coworkers to achieve good results and to struggle for the unconditional fulfillment of their socialist obligations. The active, vital position of a highly qualified specialist won him the respect of the flyers, and his military work in the past training year was noted with a State award. The communists in the unit showed great trust in S. Kiryukhin by electing him the secretary of the party organization.

The training of highly-rated specialists requires a creative approach and thoughtful planning on the part of engineering aviation service instructors. It is difficult, in fact, to organize regular classes with engineering aviation service personnel during the intense period of flight training. Life itself suggested the solution to this problem. Having discussed this issue at meetings of engineers and having studied the experience of progressive units, the engineer aviation service instructors decided to develop a specific upgrade training program for each officer, warrant officer, sergeant and soldier. The step-by-step method for training the specialists and forming their skills has also justified itself. Essentially, it consists of schedules in which each technician's and mechanic's subject for study and the time necessary to accomplish it are determined in the technical maintenance units, in servicing groups and in operational work groups.

Serious attention is also being given to the independent studies of engineering and technical personnel in the leading combat collectives. It has become a rule: for each subject, the specialist reports to his immediate supervisor in accordance with his schedule. Only then is he allowed to take his upgrade tests.

The role of aviation engineers and squadron and unit engineer aviation service instructors is of great importance in improving the technical skills of the personnel. They help the technicians and mechanics to finish their individual tasks with regard to studying the aircraft's systems and assemblies. They also give qualification consultations, organize classes in specialty training and present lectures and reports.

For example, the training of rated specialists has been well set up in the unit where Engr-Maj N. Opaleyko is the regimental deputy commander for engineer aviation services. In his unit, first-class specialists are the initiators of interesting and useful undertakings which contribute to the growth of the aviators' skills and to an improvement in technical efficiency. For example, on the initiative of officer A. Panteleyev, chief of the aviation equipment maintenance group and possessor of a master's rating, the first-class specialists looked after the young aviators. Communist Panteleyev and his coworkers carefully prepare for each lesson and training

session and conduct them with great effectiveness. Technical training is conducted in a very systematic manner, and the servicing group carries the rank of "outstanding." All the soldiers in the group are first and second-class specialists, and some have been awarded the rating of master. The aviators actively participate in rationalization operations, work on inventions and make specific suggestions contributing to the improvement of the technology and enhancing the quality of work. They also display a constant concern for conserving material resources.

An assembly of engineer aviation service deputy commanders recently took place in the unit where A. Panteleyev serves. The participants at these sessions saw and heard much that was useful and interesting. To begin with, the guests liked the way the operations had been organized with respect to the packing and containerizing of the ground service equipment, the monitoring and checking apparatus and the interchangeable equipment and weapons on the aircraft.

As a rule, officers and warrant officers holding the rating of master or specialist 1st class show the best results in preventing aviation equipment malfunctions and in checking and inspecting the aircraft's systems and assemblies. This is a definite fact. Sr Lt Tech Serv I. Araslanov, filling the senior technical post for inspecting and delivering aircraft on one of the flight shifts, detected a leak in the onboard valve for ground connection of the hydraulic system. It was very difficult to notice. Araslanov, however, was helped by his professional skill and his exceptionally conscientious attitude toward his duties. This outstanding officer was recently awarded the rating of master.

During intensive flight relays and during the days of preliminary preparation, aviation technicians pay frequent visits, since one cannot do without the experience of upper-grade specialists. Let us take just one such case. One time, while preparing an aircraft for a second sortie, Sr Lt Tech Serv V. Ivanov smelled something burning. He immediately reported this to the chief of the technical maintenance unit. It was not so easy, however, to locate the malfunction. Specialists from the radar equipment maintenance group headed by Capt Tech Serv Blagodatskikh, holder of a master's rating, rendered assistance. They quickly and accurately determined and eliminated the problem. A little while later, the repaired aircraft took off into the sky.

The officers and warrant officers of the engineer aviation service who have been awarded a high rating have, as a rule, a command of several related specialties. The young aviators follow the example of these specialists. It is proper, in our opinion, for commanders to enlist the most experienced specialists to speak in universities and technical circles. For example, the aviators always listen with interest to the technician on one outstanding aircraft, specialist 1st class Sr Lt Tech Serv I. Gavlitkiy. The officer has mastered the servicing of all types of aircraft armaments and is trained to instruct technical crews not on the regular staff.

How much work and genuine creative research is needed to improve the training base. Well-equipped classrooms, simulators, working models and electric-powered mock-ups are of great assistance in deepening the professional skills of the personnel, particularly during the period in which they master new equipment. In particular, one can single out personnel from those units where the engineer aviation service is headed by officers V. Dubrovin and I. Opaleyko. The authors have a lively interest in restoring the training base and creative initiative. Before the new aviation

complex was opened, engineer aviation service personnel resumed classes at an opportune time, opened the laboratories and made plotting boards, test stands, electrified circuits and other working visual aids. It is not by accident that these units have turned out many upper-grade specialists who have mastered to perfection the operation of modern combat aircraft.

Nevertheless, not all resources are being everywhere fully employed to train engineer aviation service specialists for the higher grades. Preparation for upgrade testing is frequently formally organized, yet the personnel find out about the deadlines only a few days before the tests. Apparently, it would be worthwhile to think about measures to encourage upper-grade specialists and, naturally, to take a more rigorous approach to evaluating their training. All of this will make it possible to identify new resources for improving the quality of servicing that third-generation aircraft receive. Without question, the dissemination of experience acquired in right-wing socialist competition also deserves attention.

Engineering and technical aviation personnel in our okrug are striving to carry out in a worthy manner their duties during flight activities, the most intensive period of training. These personnel are filled with desire to contribute toward improving the combat readiness of the Air Force and toward realizing the resolutions of the 26th CPSU Congress regarding the strengthening of the homeland's defensive might.

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## AIR FORCES

### AIRFIELD MAINTENANCE DISCUSSED

Moscow AVIATISIYA I KOSMONAVTIKA in Russian No 8, Aug 81 (signed to press 2 Jul 81) pp 30-31

[Article by Engr-Col A. Zhuravlev, candidate of technical sciences: "Airfield Maintenance"]

[Text] Personnel in airfield operations units have many responsibilities during intensive flight training. Along with keeping the landing strips, taxiways and structures in constant combat readiness, these military men carry out an elaborate sequence of preventive measures. They repair damaged sections of the surfacing, restore airfield markers, repair unimproved runways, check the status of drainage and sewage systems, fill in seams and prepare the equipment for fall and winter operation.

Constant monitoring of the status of airfield structures, timely routine maintenance of the movement area, artificial surfaces, approaches and intra-airfield roads as well as competent operation of the equipment are indispensable conditions for preparing the airfield for flight operations.

In order to carry out these tasks successfully, plans covering all airfield operations during the flight period are drawn up in the units beforehand. For example, the airfield operations company headed by Lt A. Ivanov prepared a long-range plan in which the staff determined what was necessary to be done in this area or that and what materials and resources would be required. Moreover, the company commander drew up plans not only for the month, but also for each day, coordinating them with the unit commander. Based on the flight shifts, this makes it possible to utilize time efficiently in carrying out planned measures.

Reserve engineer officer V. Kondakov was entrusted with checking the status of the movement area. The accurate determination of materials and resources necessary for routine maintenance depended upon his initiative, creativity and competent execution of trouble-shooting operations. Early in the spring, the commander of the separate airfield technical support battalion [OBATO], his deputies and the commander of the airfield operations company examined all airfield structures and facilities. At a unit meeting, the officers discussed the issue of carrying out preventive operations during the flight periods. This was also discussed at the OBATO party meeting, where the deputy unit commander delivered a report. The communists were critical of themselves as they disclosed shortcomings and miscalculations and introduced practical proposals.

Captains B. Ignatovich and Ye. Vorob'yev, for example, spoke of how the constant state of airfield readiness for flight operations depends in many ways upon the correct organization of the flight personnel's labor. It also depends upon the high moral and political qualities which they have cultivated and their feelings of responsibility for accurate and timely execution of established operational rules and routine airfield maintenance. Socialist competition, constant training and the implementation of progressive work methods play an important role.

Considering past experience, the company decided to create three to five-man teams of concrete workers and seam fillers as well as teams for the repair of arched shelters and structures, for marking the field and for carrying out work on the equipment. This has made it possible to utilize each maintenance specialist effectively and to establish careful control over the implementation of the planned program. Here it has become a rule: the commander of the airfield operations company reports daily to the unit commander about what has been done on the field in the last 24 hours, paying particular attention to the quality of the work. Such an approach did not come about by accident. Experience attests to the fact that even the least bit of negligence allowed, for example, during seam filling, can lead to water seepage under the runway. With the onset of fall and winter weather, this could also lead to open cracks and other damage. This is why the seam-filling team led by Warrant Officer V. Botvinnikov includes the most careful soldiers, who have undergone special training. They receive constant help and recommendations from Lt I. Bobrov and Lt A. Ivanov.

These specialists make use of the achievements of science and technology. When they repair the landing strip, for example, they use RBV-25 and RBV-35 rubber-bitumen binder compounds, synthetic resins and other materials. Before they resurface the runway, the specialists clean out all cracks, chips and seams using RBV compounds and then apply a base coat of primer (a solution of RBV in gasoline or another motor-vehicle fuel). In doing this, they also look to see that no pieces of binder compound, concrete, rubble or other objects remain on the landing strips, aircraft parking aprons or taxiways. These objects could get into an air intake during taxiing or takeoff and put an engine out of commission.

In order to prevent such a thing from happening, instruction, training and classes are regularly conducted with those aviators who are enlisted in repair work and other preventive operations at the airfield and in its structures. In these classes, they obtain the skill to avoid damage. Each soldier has a clear-cut idea of what to do and how to do it as well as what materials to use.

Cracks up to 2 mm wide in concrete and reinforced-concrete slabs, small sections of flaking up to 5 mm deep as well as surfacing with frequent minor damage are best filled with primer in two layers. This makes it possible for each layer to dry well. If open cracks up to 6 mm wide and chips on corners and edges of slabs up to 5 cm wide and 10 cm deep are detected on the runways, they are filled with rubber-bitumen binder compound. Sags in the slabs up to 5 cm and even sags to 10 cm deep are leveled using a paving asphalt covering. It is applied in one or two layers over the entire surface, flush with the surface of the sound pavement.

Other materials are also used to repair damages. When repairing, let us say, cracks, potholes, sink holes and the edges of slabs and butt joints, the specialists also

employ epoxy compounds. Their basic materials are epoxy resins ED-5 and ED-6. Polyethylene polyamide or hexamethyl diamine, solvents (acetone, peptizing agents), dibutyl phthalate, and fillers (pure quartz sand with grains of 0.5 to 2 mm in diameter, grade 300-500 Portland cement and powdered quartz ground to 0.63 to 5 mm grit) are used as hardeners.

In addition, epoxy glue is used to fill cracks and for primer. It consists of epoxy resin--10 percent of the batch--a hardening agent--10 to 20 percent of the weight of the resin--a peptizing agent--10 to 20 percent--and a solvent--5 to 10 percent. An epoxy-mineral mixture in a 1:3 to a 1:10 ratio is used when it is necessary to fill sink holes, potholes, edge chips and flaked areas on the runway. Grit is added to the mineral composition of the mixture for repairs of chips, sink holes and potholes up to 3 cm deep.

After they repair the surface of the runway and the taxiways, the maintenance specialists clean and wash the other sections using multipurpose street cleaners. When the surface dries, the specialists apply the markings. This work requires accuracy and a knowledge of the composition of the materials used. White silicate paint, lime whitewash or EP-5155 enamel in white, yellow and other colors are used for marking artificial surfaces.

On unimproved runways, maintenance workers replenish the sod covering, compact the ground, mow the grass and paint the launch equipment. They regularly check the moisture and density of the ground and combat rodents. At the same time, they also repair airfield structures, prepare vehicles, bulldozers, rotors and other machinery for fall and winter operation.

A great many operations are already done or are near to completion in these areas where it is sound practice to utilize every fine summer day for carrying out all preventive measures stipulated in the corresponding instructions and directions for maintaining the airfield in a constant state of combat readiness. For example, the subordinates of Sr Lt V. Naumov totally completed the preparation of equipment, runways, taxiways and parking aprons for fall and winter operation. The soldiers of this unit also work under harsh climatic conditions. A high degree of organization, however, together with good professional training and execution help the flying personnel carry out their assigned missions and maintain the airfield in exemplary condition winter and summer.

The airfield is by right referred to as the flyer's combat position. From here the air warriors depart for the endless blue of the sky. The quality of flight training, flight safety and the maintenance of complex aviation equipment depend to a considerable degree upon the timely preparation of the airfield for flight operations and careful maintenance of the runway, the taxiways and the airfield structures.

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## AIR FORCES

### SERVICING HELICOPTERS FOR FIRE SUPPORT DESCRIBED

Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 8, Aug 81 (signed to press 2 Jul 81)  
pp 32-33

[Article by Maj Tech Serv V. Kutov, deputy squadron commander for engineering aviation services: "Before the Second Sortie"]

[Text] Experience gained in providing combat training to flying personnel reveals that the preparation of a fire-support helicopter for a second sortie presents the greatest difficulty to engineers, technicians and junior aviation specialists. It differs chiefly from preflight preparation in the respect that it is necessary to refuel the aircraft and charge the systems. Live ammunition is used during tactical flight training--in underslung pods and in the basic ammunition load. It differs from postflight preparation because of the shortage of time.

I am reminded of one of the tactical training flights. We had to work under very complex conditions. Engr-Sr Lt I. Titov, Sr Lt Tech Serv Yu. Rozvyazev, Sr Lt Tech Serv V. Cherepko, their subordinates, other officers, warrant officers, sergeants and soldiers were working well.

It seemed that the organization of the work and the cooperation of the people fully met the situation that had taken shape. However, although almost no delays had occurred in the execution of the planned missions, and the flying personnel made no comment about any abnormal functioning of the equipment, we were not satisfied with the results of flight support.

We analyzed the results of our work in detail. We came to the one inevitable conclusion: we had to improve the style of work, that of the management personnel first of all. In other words, what was required was more efficient organization of the preparation for multiple combat training sorties.

This was discussed at a meeting of senior officers from the technical maintenance units of the flights and groups. Each officer gave his opinion regarding the matter under discussion. They considered the comments from pilots, technicians and aviation specialists. When the proposals were summed up and the "pros and cons" weighed, they came to the conclusion that there was still room to reduce the time for combat preparation. They also concluded that the realization of these reductions would not effect adherence to established safety measures.

Now the helicopters in our squadron are prepared for repeat sorties in tactical flight exercises in the following manner.

After the rotor stops turning, the crew informs the service personnel about the functioning of the equipment, the fuel expenditures, the ammunition load and the special-purpose fluids. The pilots themselves set part of the armament systems to their initial positions. All they leave engaged are the AZS's [expansion not provided] associated with the replacement of the cassettes for the onboard control systems.

At the same time, specialists for the helicopter airframe, engine, avionics, radio-electronic equipment and armaments fill the rotary-wing craft with fuel and lubricants and carry out a takeoff inspection. They first of all check those instruments, units and mechanisms about whose airborne operation the pilots made comments. They prepare and deliver airborne armaments to the helicopter (depending upon the type of ammunition being used). Then they install the bomb pylons and prepare the gun barrels for charging. They also prepare the machine gun and the contact couplings for the rocket pods as well as place belts in the cartridge cannister.

After they have concluded the inspections and the operations related to the use of the helicopter's onboard fire-support systems, these specialists move on to the next aircraft. Only the weapons specialists remain. They load the units with shells, spend the bombs, install the fuses and hook up the machinegun belts. While doing this, they keep the cockpit closed and the electrical systems shut down.

Communist Sr Lt Tech Serv Yu. Rozvyazev, the officer in charge of the group servicing the airborne weapons systems and the landing equipment, is a skilful educator and methodologist. He holds the grade of master. His subordinates work in teams. This is itself is nothing new, but in the search for the best methods to solve the tasks set before him, this officer proposed that the teams be assigned to specific units. This makes it possible to increase the responsibility the airmen feel toward their assigned jobs. It is then easy for the administrative staff to determine who is to blame for error or delays that crop up. Moreover, closer psychological contact is established between the team specialists and the flight engineers and flight crews of those helicopters they are servicing. This is of considerable importance from the point of view of developing their overall combat training and increasing the safety of flight operations. The experience of this group has been studied, summarized and disseminated in other units.

The search for more efficient labor methods is not the only way of reducing the time needed to prepare the equipment for repeat sorties while maintaining first-rate quality. The high level of professional training of everyone (with the exception of the maintenance specialists) plays a very important role. Our officers in charge are constantly concerned about this training. Here is an example.

Engr-Sr Lt I. Titlov, the officer in charge of the group servicing the helicopter and the engine, uses every opportunity to provide his subordinates with knowledge and skills. Naturally, he is unable to give the same amount of attention to training all his specialists. As practice shows, however, this is not necessary. Warrant Officers A. Zimenkov, A. Yegorov, A. Rovnyy, N. Silyuk and Ya. Senyuta have become his assistants, and he works with them first of all.

A great deal of work was expended, but then, the returns were considerable. Silyuk and Zimenkov, for example, have their master's ratings. Komsomol members Yegorov and Rovnyy are working up to master's standards, while Senyuta is considered one of the best specialists in the unit. All of them cope confidently with the responsibilities of an officer and willingly pass on this experience to the sergeants and soldiers. As a result, many sergeants and soldiers are capable of replacing the warrant officers.

Our soldiers master related specialities. Warrant Officer Senyuta has mastered all the group's methods of carrying out the operations. In addition, he is also a real expert in matters regarding the use of monitoring and measuring equipment. This is important. Squadron pilots quite frequently have to work on very dusty landing pads. A timely and careful determination of the degree of wear on the engine compressor blades makes it possible to avoid surge in the powerplant during flight. This increases the airmen's confidence in the reliability of the airborne equipment and flight safety.

We prepare ourselves to do battle with an experienced and well-equipped enemy. If the imperialists unleash war, it will be not only a severe test of the moral and physical strengths of the engineers, technicians and mechanics, but will also demand the highest degree of skill.

In this connection, we will examine such a case. Cables containing many wires can be damaged in combat by a shell or a large piece of shrapnel. The helicopter will be put out of commission. It will not always be possible to wait until maintenance specialists arrive at the unit.

To learn to repair damage using the resources on hand is a task which Sr Lt Tech Serv V. Cherepko, the officer in charge of the aviation equipment service group, and his most highly trained subordinates have set before themselves. This required that they have a clear-cut understanding of all the electrical systems, that they accurately read the markings on the wires and locate the wires on the helicopter without unwarranted delays. The airmen achieved their planned objective.

A hypothetical exercise situation was set up: a cable located on the right side of the cargo compartment roof was to be "cut". Many wires were concentrated in it. Komsomol member Sr Lt Tech Serv Cherepko and Communist Warrant Officer Pavkin were ordered to correct the "trouble." They worked for a long time carrying out the exceptionally difficult operation without rest or relief. There was no other way to do it--the continuous process of troubleshooting would be interrupted and the person coming in on relief would have to start again at the beginning. Thus the time needed to prepare the helicopter for the sortie would double. The specialists demonstrated their well-honed professional skills and displayed high moral and psychological qualities: a feeling of responsibility for one's entrusted job as well as persistence and endurance. Cherepko and Pavkin coped successfully with the task. I will mention here that both men were inspired on numerous occasions by socialist competition for high marks in combat training.

Specialists from a radioelectronic-equipment servicing group headed by Sr Lt Tech Serv A. Beykul have recently made a substantial step forward. They have achieved the highest percentage of equipment reliability. Because of circumstances, Officer

Beykul's subordinates often work under a light load. The airmen, however, do not sit about idle. Warrant Officers V. Borodavko and A. Oleksenko and other specialists willingly help their comrades to finish the most difficult operations once they have carried out their own immediate responsibilities.

I have already said that small groups of helicopters are used in a number of cases in combat training support for ground units and in executing other missions. This required that the officers in charge of the engineer aviation services unit have a special approach to assigning the specialists. We will create technical teams headed by one of the officers in charge from the technical maintenance units, and we will devote particular attention to the selection of personnel. If, let us assume, the senior team lacks determination and organizational skills, we will try to assign to this team the best-trained and most conscientious soldiers whose work does not demand constant monitoring. The crew is always undergoing thorough instruction in which they analyze the nature of their actions in specific cases. I conduct the instruction, being sure to bring in the officers in charge of the groups. A group of the most active Komsomol members is also being organized.

A recovery team is always at the base airfield in case a forced landing should occur. As a rule, this team is headed by the officer in charge of the helicopter and engine servicing group, whose subordinates basically comprise the backbone of the collective (other specialists can be brought in as necessary). Additional classes and training are regularly organized for them in which these soldiers learn how to make decisions effectively and without error and how to work accurately and harmoniously, each person helping one another. We are very grateful to officer specialists of the technical maintenance unit G. Nuritdinov, V. Filippovich and V. Medkov for conducting these classes.

Certain of the squadron's engineering and aviation service's successes would have been impossible without well-equipped working areas and the creation of the corresponding living quarters. Within the units were found, as they say, jacks of all trades. We have good-quality shelving and cabinets for tools and consumable materials. Visual-aid materials have been put together.

The establishment and improvement of work and rest areas required a relatively large amount of time. Moreover, everything was done without harm to the main objective--combat training support for the air crews. Such a situation brings people closer together, has a positive effect on their attitude toward work and contributes to the manifestation of feelings of comradeship, collectivism and enthusiasm for work.

Let us say a few words about work enthusiasm. It is reflected particularly vividly in the rationalizers' creative search. We have, for example, improved the makeup of the tool boxes. This facilitates and accelerates the completion of some types of work when preparing helicopters for flight and while on the airfield. Skilled craftsmen have created original examples of tools. The utilization of such tools has justified the effort completely. In response to an order, proposals were made which related to improving the design of aviation equipment and the means for operating it.

Of course, engineer aviation services personnel have not yet done everything required of them to raise the squadron's combat readiness even higher. One encounters in-

stances of poor work attitudes toward official responsibilities and violations of military and technological discipline. We will not gloss over such instances--we will make a basic evaluation of such cases and take measures to eliminate them now and avoid them in the future. In this connection, party and Komsomol organizations are working actively and purposefully. The struggle against shortcomings is being waged in all sectors, chief among which are the further strengthening of combat readiness and the improvement of flight safety.

The work of communists, Komsomol members and society has become more purposeful and fruitful after the 26th CPSU Congress. Studying its materials and resolutions, the aviators can determine more specifically their place and role in the general scheme of things. They are filled with determination to achieve new successes in combat training and in socialist competition.

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## AIR FORCES

### USE OF POLYMERS AND COMPOSITE MATERIALS IN AIRCRAFT

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pp 36-37

[Article by Engr-Lt Col Ye. Ivanov, candidate of technical sciences: "Polymers in Aircraft Construction"]

[Text] Military service members A. Anikin and D. Gaponenko ask us to discuss polymers and composite materials employed in aviation, as well as their prospects for further utilization in modern aircraft.

"Develop the production of superpure semiconducting and superconducting materials as well as new polymer and composite materials and articles made from them, possessing a number of given properties. Increase the output of synthetic resins and plastics to 6-6.25 million tons."

From "Basic Directions for the Economic and Social Development of the USSR in 1981-1985 and for the Period to 1990"

At this modern stage of development of machine construction, the drive to conserve metal is entering a new phase. The use of polymer and composite materials in machine designs, particularly in aircraft, makes it possible to solve in new ways problems associated with the construction of the latest equipment. At the same time, it leads to a considerable saving of metal and a reduction in the cost of production. The progressive role of polymer and composite materials demands the further development of their production and an even more extensive introduction of such materials into the economy. This is also important for aviation, where the reduction in the mass of a structure with a simultaneous increase in its strength is one of the urgent problems.

Polymers are a separate class of materials which cannot always be replaced with other materials and, in certain cases, prove to be altogether irreplaceable on the strength of the diversity of their physicomechanical properties. In contrast to metals and alloys, plastics possess lower densities. For example, the density of certain plastics is half that of aluminum, one-third to one-quarter that of titanium alloys and one-fifth to one-sixth that of steel. This valuable property is determined by the rigidity of the filler: for example, the glass fiber in fiberglass.

It has been pointed out in the literature many times that glass fibers are considerably stronger than natural or synthetic fibers. This depends upon the composition of the glass and the diameter of the fiber. At first glance, this is paradoxical: the thinner the fiber, the stronger it is. This, however, is easily explained. The number of fissures on the surface is reduced with a decrease in the diameter. The diameter of some fibers used in production does not exceed 8 to 12 microns. In this case, the binder substance insures the simultaneousness of the fibers' operation in the plastic material. Polyester, phenol-formaldehyde, epoxy and organosilicon resins are used as binders. It must be added that the strength-to-density ratio of fiberglass is considerably higher than some metal alloys. This is why the application of plastics in structures of identical strength makes it possible to reduce considerably the mass of an aircraft. This feature is used to the fullest by aircraft builders.

In aircraft design, fiberglass is used to make load-bearing elements: the skin of the fuselage and the wings, ribs, spars and stringers; parts of the empennage--ailerons, flaps, trim tabs and the tips of the vertical stabilizer; and various small parts--hatches and door frames. Fiberglass is also used in the anti-icing system, fuel tanks, protection walls between the tanks and in flexible membranes of fuel assemblies. The total number of plastic parts on a TU-104, for example, comes to 120,000.

Fiberglass which uses polymer and polyepoxy resins and which possesses radio-transparent qualities is used to make domes for radar stations, antennas and other radio-technical equipment. Since they undergo great aerodynamic stresses, the radomes are load-bearing elements.

One of the most important achievements of domestic science in recent years has been the creation of a new class of composite materials in which strengthening and reinforcement of a polymer or metallic binder is realized through the use of very strong and tough carbon or boron fibers. One can become acquainted with some of these at the pavillions of the Exhibition of Achievements of the USSR National Economy. Carbon and boron compounds possess the highest specific strength and rigidity among all traditional materials and appear promising for aircraft and engine construction. The use of these materials in the manufacture of an airplane's stabilizer, wing and fuselage, in a helicopter's main rotor blades and in the compressor blades of gas-turbine engines can, in the opinion of aircraft specialists, contribute to increasing the range, speed, flight altitude and payload by reducing the mass of the airframe by almost 40 percent and that of the engine by approximately 10 percent. The airframe's service life is increased three to five-fold in this case, and the operational reliability of the engine compressor is also improved. Moreover, there is a saving in scarce materials, the material utilization factor increases, the amount of equipment used in the manufacture of the airframe is reduced three to five-fold and labor expenditures are reduced by a factor of 1.5.

One can use the example of the design of the IL-62 aircraft to judge the effectiveness of using composite materials in aviation technology. Experts believe that, with the same flight characteristics, these materials insure a 17 percent reduction in the flying mass and increase the range by 15 percent and the payload by 20 percent when the flying mass is retained. In addition to their high specific strength and rigidity, composite materials are not very susceptible to stress concentrations

and provide great fatigue resistance, considerable wear resistance and electrical conductivity. They also possess insulating, antifriction, thermoinsulating, erosion-resistant, radiotransparent, radioabsorbent, energy-consuming and other special properties.

One of the important problems confronting aircraft builders is overcoming the heat-resistant barrier that exists at present and creating essentially new heat-resistant materials. If a metallic binder is used in place of a polymer binder, the resistance of the airframe structure to the ill effects of thermal heating can be improved considerably. Let us say, for example, that conventional aluminum alloys are designed for operation at temperatures of up to +200°C. Composite materials with an aluminum matrix (a binder reinforced with carbon and boron fibers), however, do not lose their initial properties at temperatures of up to +450°C. They can be used in the manufacture of airframe components, propeller blades and engine compressor blades. At the present time, designers are studying the feasibility of utilizing boron-fiber reinforced titanium alloys in the skin of the fuselage, the doors on the landing gear wells and the wing panels of heavy transport and supersonic passenger aircraft.

Traditional heat-resistant nickel alloys used to make turbine blades in gas-turbine engines can operate at temperatures of up to +1050°C, whereas composite materials of fiber construction and those based on nickel, reinforced with tungsten fibers, are capable of withstanding +1150°C. Dispersion-reinforced nickel alloys can withstand temperatures of up to +1300°C. The achievement of such levels of working temperatures for nickel alloys is associated with the boldest designs for the construction of future airframes and the powerplants for them.

In order to manufacture new materials with the best overall combination of useful properties, they must be purposefully "designed" by altering the number, volumetric ratios and reinforcement structure of individual components.

A great achievement of chemistry and the technology of polymer materials is the creation and broad application of superlight, rigid and elastic plastics--foamed plastics, honeycombed plastics and microporous polymer materials. Foamed plastics are 10 to 100 times lighter than water. In addition, they are sufficiently strong and possess unsurpassed heat and sound-insulation properties as well as buoyancy and resistance to decay. They are widely used in aircraft construction as a light-weight filler for reinforced "metal-framed plastic" or "glass textolite-foamed plastic" structures in the form of three-layer panels in which the intermediate layer is foamed plastic. They are similar to metal panels with respect to strength, but are considerably lighter. Foamed plastics are used as fillers in control-surface elements for altitude and direction: ailerons and airbrakes. Due to their light weight, they can be used in the manufacture of unsinkable items such as pontoons and ring lifebuoys.

Transparent plastics are used for glazing aircraft--organic glass, as well as complex shatterproof glass (triplex) using plexiglass or lime silicate glass. In connection with the increase in flight speed to the supersonic range, the improved thermal resistance of plexiglass is becoming more and more important. Therefore, new types of heat-resistant glass are being developed for glazing air-tight airplane cockpits. These glasses operate when thoroughly heated to +260°C and subjected to sharp drops in temperature. Triplex consists of two panels of glass bonded to

a transparent sheet. Its major advantage over plexiglass is that when subjected to large shock or static loads, a localized zone of damage is created, whereas plexiglass is usually completely destroyed.

Many plastics--fluoroplastic and textolite, for example--have good antifriction properties. They are used extensively in sliding bearings and their bushings which are used to guide the sliding movements of aviation instruments. The use of plastics with antifriction properties provides for a great economic impact: a ton of plastic replaces, on the average, three tons of such nonferrous metals as copper, tin, zinc, lead and cadmium. Fluoroplastics are the most stable of all plastics, are not soluble in any of the known solvents, are stable in acids and alkalies, do not swell in water and do not burn. They are used for the manufacture of battery cases, reservoirs for powerful oxidizing agents, chemically stable gaskets, seals, diaphragms and anticorrosion films on metals.

Plastic coatings protect metal from corrosion and give finished goods an attractive outward appearance that satisfies the present-day demands of technical aesthetics.

As is well known, electrical and thermal-insulating materials are necessary in aviation electrical and radio equipment. Plastics are poor conductors of electricity and heat. The fact of the matter is that the metallic bonding in metals which possess a crystalline structure forms a mobile electron gas which easily conducts heat and electrical energy. In polymers, the atoms included in the major bond are held together by chemical bonding. Therefore, they possess high thermal and electrical insulating properties.

The best insulators for high-frequency technology are polyethylene, polystyrene and polytetrafluoroethylene. Getinaks, tekstolite and balinite are extensively used as electrical insulating materials. For parts that operate under high temperatures, mikonite, mikaleks, polystyrene, polyethylene and organosilicon polymer materials are used. For the purpose of thermal insulation, we use foamed plastics which we are already familiar with and which are based on polystyrene, polyvinyl chloride and polyurethane.

The extensive application of polymer materials in various areas of aircraft construction is to a great degree related to their considerable technological properties. These properties make it possible to subject such materials to processing by pressure, cutting, welding and bonding. For example, metal parts require three types of processing: casting, heat treatment and milling. Plastic parts, on the other hand, require only one: forming through plastic deformation. This is why, as it is stressed in the documents of the 26th CPSU Congress, the introduction of plastics and composite materials into the economy will reduce the expenditure of raw materials, fuel and energy, will increase labor productivity and will reduce production costs by a factor of two to three.

In a word, the application of polymer and composite materials in aircraft construction as in other sectors of the economy makes it possible to utilize more completely and efficiently the production potential of our homeland.

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## AIR FORCES

### AN AIR FORCE DOCTOR'S DAY DESCRIBED

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[Article by Col V. Lebedev: "No Right To Err"]

[Text] The senior physician of the aviation regiment, Maj Med Serv A. Lonshakov, had gotten up early: flights were scheduled. Arriving at the airfield long before the first flight, he checked the condition of the medical support equipment, met with the squadron commanders and their fighter air unit deputies, inquired about the health and morale of the aviators and talked with members of the flight control group.

Returning to the airfield medical post, he sat at the table. Soon the pilots would arrive for their medical checkups, performed before each flight shift. The officers, sergeants and soldiers in the regiment know Maj Lonshakov well. The sensitive and careful doctor had rendered aid to many of them in difficult moments. He has had various cases in his medical practice and has encountered situations where a man's life hung on a thread. Only the timely, competent and decisive actions of the air regiment's senior physician and his kindly, caring colleagues averted trouble. Let us just take a case that happened yesterday.

The workday was coming to an end. Anatoliy Stepanovich removed his white smock and was about to head for the exit. At that moment, however, senior nurse Lidiya Shcherbak hurriedly entered his office.

"Anatoliy Stepanovich," she said with alarm, "they have brought in an injured man. He was in an automobile accident. His condition is critical."

The door of the ambulance was wide open. Lonshakov saw a lifeless man about 30 years of age stretched out on a bench. Officer medics A. Knyazhenskiy, A. Vydush and O. Popov hustled about alongside him.

"His blood pressure is zero," Capt Med Serv Knyazhenskiy reported softly, rolling up the rubber tubes of the phonendoscope.

Maj Lonshakov took the patient's hand. He checked the pulse and began giving orders.

"Do everything you can to stop the bleeding. Otherwise it will be too late." He started to massage the patient's chest in the region of his heart.

The victim was on the verge of clinical death. His pulse was barely perceptible. The doctor had to make the heart function and stimulate breathing. Anatoliy Stepanovich looked at the victim's face. Indeed, were those cyanotic spots? He took the patient's clammy hands and with vigorous motions began to restore his breathing. Up, a little to the side, then down. Again. One more time.

Meanwhile, Capt Knyazhenskiy examined the traumatized portion of the patient's body.

"The lower pelvis is broken," he replied to Lonskakov's question. "Judging by everything, there is damage to the internal organs. The bleeding has stopped."

Anatoliy Stepanovich continued working silently and intensely, restoring the functioning of the lungs. "Now we have to get him to a hospital, to an experienced surgeon," he thought. It was not far from the military post to the hospital. If only he could hold on!

The doctor lowered the patient's hands and checked the pulse again. It seemed that the patient was reviving. At this time a report came in: the resuscitation equipment was on the way.

Lonshakov quickly glanced over the tray Lidiya Shcherbak was holding.

"Spirits of ammonia and camphor. We will have to inject it directly into a vein." Anatoliy Stepanovich wiped the patient's brow with a cotton swab.

Each procedure was carried out quickly and accurately. The physician's entire attention was concentrated on monitoring the pulse. Suddenly, he had a thought: "Maybe I wasted my time by not going to surgical school. The choice was completely mine. A friend had talked me into it. Is it, however, simple and easy to become a therapist? Is it less crucial than becoming a surgeon?"

The vehicle marked with the red cross finally arrived. By this time the patient's pulse was beating more rhythmically, and his blood pressure had begun to rise slightly. It appeared that the threat to life had passed. Much, however, would depend upon the impending operation.

Before leaving for work today, Anatoliy Stepanovich called the hospital, interested in how the patient was feeling.

"The operation has been performed. The patient's condition is satisfactory. He has returned to consciousness," they answered.

Meanwhile, yesterday's case was not the only one. Late in the evening, the telephone rang in the doctor's office: "Come immediately! Sr Lt Shapinskiy has taken ill." Anatoliy Stepanovich was well-acquainted with this healthy pilot who had a penchant for sports. What could have happened to him?

Lonshakov entered the room. The comfortable room was softly lit by a floor lamp. His wife hurriedly said: "This isn't the first time this has happened to him."

The doctor examined the patient. On the face of it, he had the symptoms of intercostal neuralgia. He gave the pilot an anesthetic and wrote him a hospital admission slip--under stable conditions, modern instruments would help to determine exactly the reason for his ailment. Further events showed that Maj Med Serv Lonshakov was not wrong in his diagnosis.

In the morning, Anatoliy Stepanovich hurried to work. His wife, Lyubov' Vladimirovna, also a physician-therapist, went to accompany him.

"Stop by at the library, please," he said. "It is on your way. Here is a list. I have indicated the literature I need. Ask if they can get these."

Lyubov' Vladimirovna quickly looked over the even, neatly written lines. The note mentioned books on flight personnel examinations and the physiology of investigating the pilot's organism under the influence of various flight factors. The list was long.

"You do not have to get everything at once," said Anatoliy Stepanovich. "Just these here in the first row," he said, indicating several items.

On the way to the airfield Lonshakov once again thought about what he had to do today. First of all, he had to conduct a medical check of the flight personnel before the start of flight operations. He then had to prepare the materials for the officers' dispensary and check the nursing staff.

A knock at the office door interrupted his thoughts. The first patient had arrived--military pilot 2nd class Sr Lt V. Ageyev, secretary of the squadron party organization. The doctor knows well the health status of each airman in the unit and carefully watches how the pilots observe their preflight regimen.

"Everything is normal, doctor," said the pilot.

The unit's senior physician was also confident of this fact. Indeed, Ageyev was regularly active in sports, was constantly concerned about his level of training and strictly observed his preflight regimen. He received the highest marks for each flight mission he carried out in the air.

"You are free to go. There are no discrepancies. Have a good flight."

Hardly had Ageyev left when another pilot appeared. Maj Lonshakov carefully checked the airman's condition, then inquired interestedly how he was combining work and relaxation, what he was doing to improve his health and whether things were normal at home. Behind the doctor's questions one could sense the man's profound understanding of his business, his careful and sensitive relationship with people and his striving to determine the pilot's health status by the slightest symptoms. If one of the airmen complains about feeling out of sorts, the doctor will make an accurate diagnosis. Indeed, he has no room for error.

Senior regimental physician Maj Med Serv Lonshakov is constantly improving his professional skill. The senior officers in charge speak highly of him: he knows his business and he loves it, he regularly reads the special literature, scrupulously

follows medical innovations and competently organizes medical support in accordance with the nature of the impending flights.

Lonshakov came to the regiment from the Military Medical Academy imeni S. M. Kirov, where he had attended a complete course of lectures in the department of aviation medicine on physiology, hygiene, psychology and flight personnel medical examinations. He had also mastered the basic investigative methods of other specialities: therapy, neuropathology and ophthalmology.

The telephone rang. Lonshakov picked up the receiver. The secretary of the air regiment's party committee inquired interestedly about the health of the pilots and asked if the doctor could in the near future speak to the aviation engineering personnel about the role of psychological training of aviation engineer service specialists in the operation of modern aviation equipment.

"I agree. I will get ready!"

Returning home, Lonshakov saw from afar the light in the windows of his apartment. His wife opened the door. She indicated with a gesture that he was not to make any noise. The reason was clear--his son Yuriy was already sleeping. While he was undressing, Lyubov' Vladimirovna showed him the literature that he had asked for.

"Very well. Thank you!"

In the evening, after he eats, he will sit down to read a book and will study until late. Indeed, in order to be a help to people and to make a significant contribution to increasing the unit's combat readiness, one has to constantly work on oneself and enrich one's knowledge.

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## GROUND FORCES

### TANK UNITS: TRAINING AND RELATED ACTIVITIES

#### Night Attack Training

Moscow KRASNAYA ZVEZDA in Russian 16 Jul 81 p 1

[Article by KRASNAYA ZVEZDA correspondent Lt Col A. Khorunzhiy, Northern Group of Forces: "Night Assault"]

[Text] Improvement of night training is one of the tasks being accomplished by troops in the process of summer combat training. At night drills and exercises, in conditions maximally approximating actual combat, the men learn to perform skillfully at night and to hit targets accurately. A recent exercise was a stiff test of preparedness for night actions for the tank crews of a certain unit.

The situation in which the tank battalion under the command of Maj N. Loginov was to carry out a mission was complicated -- the tank crews would be engaged in offensive exploitation during hours of darkness, in conditions of close contact with the "aggressor."

The battalion commander and his staff made particularly thorough preparations for the night action. On the eve of the exercise, holding commander training drills, officers, warrant officers and noncommissioned officers studied the specific features of night combat and safety measures. Night tank gunnery drills were held in the companies, at which they worked on performance standards in tactical, weapon and technical training, protection against mass destruction weapons, plus other training topics. We should emphasize that in this battalion a substantial percentage of scheduled exercises and drills are held during hours of darkness. Competition under the slogan "Meeting daylight performance standards at night" is as a rule organized at these activities.

At the initiative of party members and the battalion Komsomol bureau, competition right-flankers platoon leader Sr Lt V. Parakhin, tank commander Sr Sgt N. Teryayev, and other winners in the competition for the title of top specialist spoke in the companies. They shared their experience and know-how in night actions, discussed the most efficient means and methods of reconnoitering targets and delivering fire for effect on various "aggressor" weapons in a complex night combat situation.

Tank battalion commander Major Loginov devoted a large part of the time allocated to night combat training to organization of teamwork and coordination between the battalion's subunits and the supporting artillery battalion under the command of Maj V. Belyankin, as well as attached subunits. In particular, an illumination support plan was worked out in detail. The various possible engagement variations were played out on a terrain model with command personnel of all levels.

...The night engagement began at the designated time. Proceeding under cover of darkness, the tank battalion, together with attached subunits, with artillery support, mounted a surprise attack on the "aggressor" and broke through his defense with a swift assault. Skillfully exploiting the darkness factor and the power of their weapons, the tanks confidently advanced, clearing the way for the other subunits. Particularly high tactical and weapon proficiency was demonstrated by the tank platoon under the command of Senior Lieutenant Parakhin. Skillfully executing a maneuver and moving into the flank of the defending force, the platoon boldly engaged superior "aggressor" forces and was a major factor in promoting the battalion's successful offensive operation. The motorized riflemen, mounted on infantry fighting vehicles, performed with precision and coordination.

The pace of combat increased minute by minute. Well conceived terrain illumination procedures enabled the attacking force quickly to spot and accurately to hit targets. Weapons fired on the basis of periodic and continuous illumination, at muzzle flashes, as well as with employment of night vision devices.

The "aggressor" offered stubborn resistance. He moved up reserves from deep in the defenses. He proceeded to fire antitank guided missiles at the advancing tanks. Major Loginov ordered mortar battery commander Sr Lt A. Aleksanov to neutralize the antitank missile launchers.

Taking casualties, the "aggressor" proceeded to fall back. At this moment a scenario change was received: according to intelligence, an "aggressor" tank battalion was moving forward to launch a counterattack. The battalion was assigned the mission of repulsing it.

The battalion support echelon was engaged. The tank company under the command of party member Capt N. Saidov, reinforced by a motorized rifle platoon led by Sr Lt A. Kravchuk, was assigned perhaps the most difficult mission -- to stop the "aggressor" tanks. Executing a deep maneuver, the company advanced onto likely lines of tank approach to cover the battalion's right flank. The tank crews opened fire at maximum range. Success in such an action is inconceivable without skillful organization of fire, knowledgeable fire control, precise target designation, and correct adjustment of fire. The excellent results achieved by the men of Specialist 1st Class Captain Saidov in firing at maximum range, achieved thanks to regular practice drills, ensured the company's success in this night engagement.

Following on the heels of the right-flank company, as the "aggressor" tanks approached, other subunits opened concentrated fire. The men of the artillery battalion hit the armored targets with highly accurate fire. The counterattack was broken off. The tank battalion proceeded to pursue the withdrawing "aggressor"....

The battalion received high marks for its smooth actions and initiative displayed at the exercise. The postexercise critique, however, laid more stress on errors and unexploited opportunities. In particular, it was stated that at one of the stages of the night engagement the artillery crews had been late in opening fire -- the firing data had not been expeditiously prepared. The tank gunners had made mistakes in their firing. Some of them did not possess adequate skills in night gunnery. In short, the exercise results were the subject of a close analysis, which will help the tank crews in the summer training period improve the quality of and efficiency of combat training and the effectiveness of competition.

#### Tank Maintenance Unit Activities

Moscow KRASNAYA ZVEZDA in Russian 22 Sep 81 p 1

[Article by Maj N. Kikeshev, Red-Banner Transcaucasus Military District: "Across a Mountain River"]

[Text] This mountain river was quite capricious. In the midst of the summer heat it would sometimes rise suddenly, carrying off in a mighty flood the meltwater from snows high on the peaks of the Caucasus.

Sr Lt N. Dakhin, in command of a repair and recovery party, was well acquainted with this fact. And now, as the tanks were practicing underwater operation, he was keeping a close watch on the water level in the river and the movement of the tanks. His men were ready instantly to come to the assistance of the tank crews.

The men assigned to the repair and recovery party were experienced veterans. Many interesting things could be told about each and every one of them. But Sr Lt N. Dakhin talks with particular satisfaction about prime mover driver Pfc N. Tarasov. He is the unit's top specialist and platoon agitator. Col Gen O. Kulishev, commanding general of the district, awarded Pfc N. Tarasov a watch for bold actions and initiative at a tactical exercise during which tank crews were crossing a river submerged.

...On that day the men of the repair and recovery party under the command of Sr Lt N. Dakhin, who included Private 1st Class Tarasov, were also ready to come to the assistance of any tank crew. Dakhin was the first to notice that at the point where the current was swiftest, one of the tanks began to deviate from the crossing route.

"What do you hear on the radio?" the officer asked his radio operator.

"I hear the command: 'Number 3, halt!' But the tank crew is not replying. Evidently the radio, following the scenario instruction, 'is not working'."

This was indeed the case. The higher commander wanted to test the tank crews and recovery people in an unaccustomed situation.

"They have become confused and forgotten about everything," Dakhin thought to himself. "If they have lost communications, they should stop the vehicle even without instructions."

Yes, there is a firm rule: if during a crossing move a driver fails to hear a radio command within a specified time interval, he is to stop the vehicle, but keep the engine running. There is good reason for this rule. Its observance prevents tank crews from wandering off a reconnoitered and marked crossing route. In addition, the commander's voice over the radio helps the crew maintain confidence when submerged.

But on this occasion the rule had been violated. The tank continued to wander downstream from the crossing, until it lodged against a rock and came to a halt. During this time the repair and recovery party was already hastening toward the tank. Pfc N. Tarasov was operating the prime mover, while Sr Lt I. Titenko, who was directing his actions, was on the snorkel.

This was the 30th time Tarasov had driven his prime mover underwater. It is no easy job to arrive precisely at the desired point when there is no visibility, while commands must be executed instantly. But Tarasov operated the prime mover flawlessly. He was assisted by his great skill. He owes his skill mostly to WO V. Shulika. He had taught his subordinate not to be afraid of the water, to maintain self-control and composure in difficult situations, and to operate his vehicle flawlessly in water, which is much more difficult than on dry land.

Sgt Z. Kurugliyev spotted the tank turret handrail in the water and got a boathook on it. The boat drew up to the tank's snorkel and stopped. Senior Lieutenant Dakhin shouted down the pipe: "What happened, tankers?"

"Communications are out and the engine stalled," came the reply from below.

The officer reassured the tank crew and said to them in a confident voice: "Stand by; we'll pull the tank on shore."

Senior Lieutenant Dakhin, in command of the repair and recovery party, acted swiftly and with initiative.

"Put your levers in a neutral position and disengage the transmission," he instructed the tank driver.

Within seconds the submerged tank's tow cable was secured to the prime mover. Executing the officer's command, Private 1st Class Tarasov turned the tank, maneuvering, and pulled it onto the riverbank, negotiating submerged rocks. It was a difficult job, but the tank was soon on shore.

That was how it had been at that exercise. And now, aware of the fact that preparedness for any unexpected occurrence should be constant, Sr Lt N. Dakhin and his men kept a close watch on the tanks.

Following the exercise director's scenario, one of the tanks was halted where the current was swiftest. Private 1st Class Tarasov went to work. Within a few minutes the "stalled" tank was on shore.

Soon the repair and recovery party proceeded with a drill in recovering equipment towing on a close coupling. In the middle of the river, where the current was swiftest, the repair and recovery party received a scenario instruction: stop the

prime mover. Anything can happen in a combat situation. A prime mover can also break down.

Warrant Officer Shulika and Private 1st Class Tarasov -- those with the greatest river experience -- came to the rescue. Cables were secured. Tarasov drove his vehicle onto the bank. But he could not tow both the prime mover and the tank simultaneously -- it was too much for a single vehicle. Senior Lieutenant Dakhin quickly found a solution to the problem. He and his men rigged a block and tackle system and pulled the vehicles out of the river.

The repair and recovery personnel in the subunits under the command of Sr Lts N. Dakhin, I. Titenko, and WO V. Shulika are working hard to master their skills. These subunits are among the leaders in competition for excellent combat readiness and firm observance of regulations.

#### Ambush Attack Training Discussed

Moscow KRASNAYA ZVEZDA in Russian 4 Oct 81 p 1

[Article by Sr Lt I. Vakhnov: "With Stealth, From Ambush"]

[Text] The tactical situation was complex. An "aggressor" tank battalion was swiftly approaching the advance covering force of motorized riflemen. The flat terrain with isolated small stands of deciduous trees gave the counterattackers a clear view of the horizon and unrestricted air surveillance. There was little probability that aircraft of the advancing force could take them by surprise. Anti-aircraft weapons were advancing together with the "aggressor" tanks, carefully probing the blue sky with invisible radar beams.

They were getting close to the counterattack point. The tanks began to redeploy into approach march and combat formation. Suddenly helicopter gunships appeared. They seemed to leap out of a stand of birch trees, and then they dove abruptly. But they had already fired their rockets in the direction of the tanks.

The appearance of the helicopters took the "aggressor" by surprise. This was in fact the intention of the section commander leading the group. He figured that they should fire rockets at the tanks. To be effective, it was necessary to get within a certain range of the "aggressor" tanks, and this meant getting within the range of his antiaircraft weapons as well. They could gain the element of surprise, and consequently achieve success only by operating with stealth, from ambush.

The attack lasted only minutes. Everything done up to the attack involved days and hours of preparation on the ground. "Walking through" drills, repeated theoretical calculations, classes in tactics and effective combat maneuvers. But perhaps the main preparation activity was flying the helicopter in terrain-hugging mode, putting it down into so-called "wells," from which they could attack with concealment, from ambush. I happened to attend one such practice drill.

Capt Yu. Suvorov's section was practicing putting the helicopter into a "well." This is a difficult drill. The pilot must bring his helicopter precisely onto an area of limited dimensions and land it flawlessly. This requires solid flying skills and perfect navigation -- in short, that which is called crew skill and coordination.

Captain Suvorov has logged more than 1,500 hours. On the eve of the opening of the 26th CPSU Congress he became a military pilot 1st class. But this mission was quite a test for him as well.

The helicopter was practically grazing the ground. There was forest to the right and left. This flight kept the entire crew in a continuous state of tension. Pilot-navigator Sr Lt V. Lyaksa was flying copilot. He closely monitored a stopwatch, airspeed, altitude, made calculations, followed the route by map, and adjusted heading.

We passed a reference point. Tree stands and brush flashed past, followed again by unbroken forest. Soon we reached a small natural clearing, like clear water on an ice-covered lake. This was our "well." Captain Suvorov responded instantly. The helicopter immediately dropped lower and hovered in the "well." A few seconds later the vehicle proceeded to settle onto an area marked by white flags.

"Captain, 1 meter left.... Two meters forward," Senior Lieutenant Lyaksa gave corrections. "Stop! Down!"

At this point the pilot-navigator also took the controls: to back up the pilot. The helicopter dropped precisely into the "well."

Reporting back to the officer in charge of flight operations, Suvorov took off. Now Senior Lieutenant Lyaksa took over the controls, for he is not simply a navigator but a pilot-navigator. Therefore he also needs solid piloting skills. In addition, Captain Suvorov, seated alongside, is an experienced instructor.

The pilots' performance could be clearly seen from the ground -- each and every maneuver, the moment of attack, and its results. Only one thing could not be seen -- how the helicopters, practically grazing the ground and hiding behind terrain irregularities, had taken up position in the "wells" in the birch stands to set up ambush. They achieved this thanks to the excellent professional skills, persistence in military labor, and combat coordination of the aircrews.

The motorized riflemen received effective air support.

#### Dawn Battle Training

Moscow SOVETSKIY VOIN in Russian No 17, Sep 81 (signed to press 13 Aug 81) pp 2-3

[Article by V. Vozovikov: "Engagement at Dawn"]

[Text] The hilly plain was dead still in the faint, gray predawn light of summer. The sharpest eye could not spot even the slightest movement, but the tank company commander, Sr Lt Igor' Veselov, almost physically felt the enormous tension of life all around him. Powerful life, ready to announce its presence on the first word of command. This tension produced in him an impatient expectation and acute alarm, driving away fatigue and sleepiness. Veselov could not yet make out his own tanks. Covered with the dust of a long night march, they dissolved in the morning gloom, merging with the gray, sun-baked earth. He could only divine their squat steel bodies, which had not cooled off overnight, and in his mind's eye he could see the familiar faces of the tank crews in the warm darkness under the armor. They had not

closed their eyes once all night; all night they had been rocked and shaken by their moving vehicles, and now it would be easy for the young crew members, who are not as toughened as their commander, to nod off and fail to hear the radio signal.... Was this not the cause of his inner anxiety?

The company stood in a line of platoon columns at the bottom of a broad hollow, concealed by an elongated, flat-crested hill, beyond which the battalion main forces and attached subunits were presently disposed in a defensive posture, ready at any moment to engage large "aggressor" forces advancing from the south. After the "aggressor" becomes locked into battle for this range of hills, it will be the turn of Senior Lieutenant Veselov's company to swing into action. Advancing swiftly from deep in the battalion defenses and driving into the "aggressor's" flank, its mission is to attract the enemy's attention, involve him in an exchange of fire, and support a general counterattack by the main forces. This mission was no novelty to Veselov, but his vague feeling of anxiety grew as it became lighter.

"In war the most dangerous time is dawn," somebody's words were repeated in his mind, and he suddenly remembered that he had heard them from his father, a veteran soldier who had gone to the front in 1943, had taken part in liberating the Baltic and assaulting the fascist fortresses in East Prussia. The former combat artilleryman was right. Now Igor' Veselov himself knew how anxious the hours of dawn were even at exercises. And not only because attacks were often scheduled at dawn. At night the situation on the battlefield does not change as appreciably as during the day, and therefore the most unpleasant surprises take place in the morning.

The company was positioned on the battalion's left flank -- thus it would be easier to execute the planned tactical maneuver, and if the situation required, expeditiously to meet and parry flanking "aggressor" forces. The commanding officer had given clear instructions on this score. But there was nobody to Veselov's left. He knew for sure that there were no friendly forces there. But were they really so empty, those foothills receding eastward, dissected by hogback ridges and dry, deep creek valleys, difficult of access to tracked and wheeled vehicles? After all, the battalion commander, after issuing the order, commented to Veselov: "Watch your flank and rear...." The fact is that no reconnaissance is capable of looking into every creek valley and behind every ridge. And in addition, since today entire subunits are capable of being swiftly airlifted together with their heavy weapons, one must be concerned about exposed flanks and rear. Fighting could erupt simultaneously on the main line of resistance and in the rear.

Nearby hilltops could be clearly seen emerging from the gloom, shadows receding in the creek valleys, and Veselov could see his tanks disposed in platoon columns, positioned in such a manner that they could deploy from position into an extended line fronting southward. But even the sight of his tanks, ready both for march and attack at an instant's notice, failed to bring that familiar feeling of confidence. The "aggressor" was near, but had not yet indicated his presence; there was dead silence even at the battle outposts. Could he be waiting for the end of twilight? But for tanks and motorized infantry twilight is no hindrance in an attack, but rather the contrary....

Regardless of the fact that you are only a company commander who has been positioned in the battalion support echelon with a precisely defined mission, nevertheless you

must also think for the "aggressor," especially if you have an exposed flank which you have been ordered to watch.

The longer Veselov thought about it, the more closely he examined the area, the clearer the reason for his anxiety was becoming. Yes, the company was ready instantly to meet and repel an "aggressor" frontal attack, and even an attack from the rear -- all they had to do was turn the tanks around in position -- but it could not so quickly carry a surprise attack from the exposed flank. It would require several minutes to redispouse, but in today's combat the company might not have a single tank left after a minute.

He was not authorized to make radio contact with the commanding officer prior to engagement, but he could not simply stand there doing nothing. The simplest thing was to stand where you have been placed -- he could use that as the reason why he had not given instructions to change position. But there is also the commander's duty, his awareness of his personal responsibility for optimal execution of his mission and for his men, whom he might tomorrow be leading not into mock battle but into real combat. And these men's trust and confidence in their commander -- and consequently their courage and decisiveness in a combat situation -- are born and strengthened today. He had no doubt whatsoever that the battalion commander would also see now, at dawn's light, that it was dangerous to leave the company in such a position.

"Private Fomin!" Veselov called to his loader. The latter fidgeted in his seat but did not respond immediately.

"Are you sleeping?"

"I was lulled to sleep a little, comrade senior lieutenant. And now everything is so quiet -- I can hardly keep my eyes open."

"Yes, it is strangely quiet.... Here is what I want you to do, Fomin. Go over to the 3d Platoon and tell Lieutenant Gordiy to turn his tanks to the left and move in an extended line onto that ridge," he pointed to the ridge. "They are to wait there until they receive additional orders. Orders are as follows: they are to be ready to repulse an 'aggressor' attack into the company's flank. All tank crews shall maintain terrain surveillance and keep radios on receive. They are to report immediately to the platoon commander by radio if the 'aggressor' appears! Repeat the orders."

After the order had been repeated back, he added: "Tell Gordiy to keep an eye on me also. If the company begins to move out on orders from the battalion commander, they are to abandon their fire positions, form the platoon into a column and rejoin us at good speed."

The soldier had already jumped down to the ground when Veselov had a sudden thought: "Wait a minute. Also tell him to move up onto the ridge in first gear, minimum rpm -- so that there is neither smoke nor dust."

"Yes Sir!" the soldier broke into a trot -- he was pleased to stretch his legs after sitting in the tank for such a long time.

Obviously the engine noise reached the battalion commander -- a few minutes later a vehicle ground to a halt by the knoll on which the commander's tank stood concealed in a saddle on the knoll crest. A short, well-built captain, the battalion deputy commander for political affairs, ran swiftly up the knoll and nimbly climbed up onto the tank hull.

"Were you 'warming up' your engines?" he asked with an ironical smile. "Or did somebody kick in his starter? Wait a minute, where is your third platoon?"

Veselov pointed to the tanks which were stretched out along the ridge crest. He could make out the figures of the tank commanders standing in the open turret hatches, holding binoculars.

"What kind of a disposition is that?" the political worker feigned surprise, but his eyes were twinkling.

"Comrade Captain," replied Veselov in a serious tone. "Yesterday you asked at the party meeting: what is the most important thing in war?"

"That is correct. What about it?"

"Vigilance -- you answered your own question. Now take a look; can I leave the battalion flank exposed?"

The captain looked around for a minute, and then replied pensively: "Perhaps in war your decision would be correct. Therefore it is also correct at an exercise. That is what I shall report to the battalion commander." He fell silent, gazing through the binoculars at the distant ridges. "The 'aggressor' seems to be up to something. At any moment the company may be redisposed; it would be best to keep it in a tight formation...."

"Well, if orders come, the platoon will quickly join up with us."

"Gordiy won't fall asleep again?" the captain grinned.

"I don't think so," replied Veselov, embarrassed.

At the last company exercise Lieutenant Gordiy had fouled up. The battalion commander had summoned the company's officers, and everybody reported but Gordiy. They had to send for him. The lieutenant honestly confessed that he had fallen asleep in his tank and had failed to hear the call. Candor mitigates culpability, but Veselov, angry, dressed Gordiy down in front of all the battalion officers. The deputy commander for political affairs later admonished him for his quick temper -- it would have sufficed to have a talk with the lieutenant alone. Veselov agreed, but the deed had been done....

"By the way," the captain continued. "At this exercise Gordiy's platoon in my opinion is performing as well as the others."

"I would say even better. That is why I sent him up to the ridge...."

"You did right. Let him get used to command responsibility. Some lieutenants have been an entire year in a command slot and yet in their heart they are still a cadet....

And I would advise you not to delay canceling punishment."

"I won't. Unless he falls asleep today."

"Okay, I'm going to say hello to your tankers...."

The captain jumped down off the tank, but then stopped short. The air trembled lightly from a distant salvo. Immediately Lieutenant Gordiy's voice rang out sharply and clearly in Veselov's headset. It was not a report, however, but a command. Surprised the first instant, Veselov immediately realized that the lieutenant had decided not to lose a single second, for both the company commander and possibly the battalion commander himself, hearing his command, would understand what was taking place.

"This is 23!" his voice rang in the headset. "Fire at helicopters, fragmentation.... Sight 10...."

Even before the platoon's guns roared, Senior Lieutenant Veselov spotted in the distance, above the ridges, fleeting shadows rocking and dully gleaming on the pale background of the light of dawn. He was about to ask the lieutenant how many helicopters there were, but the lieutenant responded before he could ask. Now that the command had been given and the tank guns and machineguns had swung into action, he could report: "Twenty! A section of helicopter gunships is coming into our rear. I am firing at them.... They are right at ground level, hiding in the hollows. A thousand meters right ahead of me, beyond the hilltop, are concealed up to six troop-carrying helicopters. I assume they are putting down assault troops. This is 23, over!"

There was heavy fire southward, beyond the hills. So that was why the "aggressor" waited for dawn: it is dangerous for helicopters to fly in hill country during twilight. This meant that they were attacking simultaneously frontally and on the flank.... Had the battalion commander heard Gordiy? He must report immediately....

But the battalion commander had heard. He did not ask how it was that his reserve company had contrived to engage so quickly. He had confidence in Senior Lieutenant Veselov, just as Veselov had confidence in Lieutenant Gordiy. In addition, he had sent his deputy commander here....

"Twenty, listen carefully." The battalion commander's voice was firm and even, as if he were issuing an order in some quiet valley to his assembled officers. "Deploy and attack the assault force. Proceed as the situation dictates. Do not dig in elaborately; if necessary shift to the defense, but hold the flank. You will be supported by motorized riflemen and antiaircraft gun crews attached to the battalion. Read back."

Veselov repeated the order, anxiously listening to the firing. Tank platoon fire became less frequent, but the platoon was no longer alone. The sharp reports of multibarrel antiaircraft guns could be heard from a commanding hill deep in the position. The antiaircraft gunners, spotting the helicopters, drove them behind the distant hills, preventing them from spotting the tanks and attacking them with rockets. Now a great deal depended on the outcome of this duel between the antiaircraft gunners and helicopter pilots. At an exercise, just as during war, one

realizes particularly acutely that victory is a common cause, that in battle tens and hundreds of people, even strangers, are directly responsible to one another.... And the battalion commander can give thanks for the motorized riflemen. Without them the tank crews would have a hard time of it in the labyrinths of the rocky hills and ridges....

It did not take the tanks long to redeploy into combat formation in the hollow, but nevertheless these were anxious moments for Veselov. Helicopter penetration at such a moment could cause serious problems. But the antiaircraft gunners knew their job: when the extended line of tanks reached the hill crest, the antiaircraft guns fell silent -- there was nobody left to repulse. Now the tankers were confident: they would not be without cover in an attack -- the antiaircraft gunners could see a long ways from the hill.

Still sheltered by the hilltop, the company waited in silence for the arrival of the motorized riflemen. The "aggressor" assault troops were also advancing without a shot. Perhaps they thought that the few weapon positions on the hilltop had been neutralized by helicopter fire, and the "aggressor" decided to execute a surprise penetration into the battalion main force dispositions. Veselov estimated the strength of the attacking force. At least two companies, self-propelled guns were advancing in the infantry formations, and he could already distinguish RPG men, a great many of them.... An attack could not be effective without motorized riflemen, but an attack was essential. That was the only way to destroy the "aggressor" decisively and quickly. A protracted engagement was dangerous -- troop-carrying helicopters could bring in reinforcements to the "aggressor," and it was difficult to say where they would be put down. In order reliably to hold the flank, as the battalion commander ordered, this force should be wiped out without delay.

The infantry fighting vehicles were already deployed in the hollow behind the tanks, and the extended line of motorized riflemen was rapidly approaching.

"Where is our deputy commander for political affairs?" Veselov suddenly thought to himself as the tanks, spouting gun and machinegun fire, were charging down the slope toward the attacking "aggressor" and the motorized riflemen were running behind them, firing as they advanced, while the infantry fighting vehicles, taking the tanks' places, were delivering fire from the ridge in support of the counterattack.

...The engagement ended in 15 minutes. The battalion commander issued an order by radio to withdraw the tanks immediately to a new position which was more suitable for defense, and he summoned the motorized rifle subunit to his position. Senior Lieutenant Veselov, opening the hatch, used signal flags to order a general turn, followed by formation into platoon columns. The motorized riflemen were already mounting their vehicles, which had caught up with the extended line. Somebody climbed up onto the commander's tank. Veselov turned around and recognized the deputy commander for political affairs. Grabbing the turret handrail, the latter leaned forward toward Veselov and asked: "To a new position?"

"Yes, battalion commander's orders."

"I guess things are hot and heavy there. Don't delay." Wiping perspiration from his brow, he shook his head. "It was cleverly conceived. If Gordiy had failed to

spot them and had not met them with fire, they would have pounded us to jelly. What is the most important thing in war?"

"Vigilance, Comrade Captain."

"Correct, company commander, get moving; don't delay."

The fighting to the south seemed to be drawing closer and becoming more intense. The tanks moved out in platoon columns toward the increasing battle noise, ready instantly to deploy into an extended line.

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## NAVAL FORCES

### SURFACE VESSELS: TRAINING AND RELATED ACTIVITIES

#### Navigator Training on Large Antiship Vessel [BPK]

Moscow Krasnaya Zvezda in Russian 13 Oct 81 p 2

[Article by Capt-Lt S. Ishchenko: "From the Lieutenant's Berth"]

[Text] Semidarkness reigns in the charthouse. Lt Aleksandr Rusakov laid the straightedge aside and slid away the jointed lamp mounting that was fastened to the table. In the yellow oval of light, the heading, which stretched from end to end on a map of an area of the Mediterranean Sea, became more clearly visible.

"Well, navigator, what do you have?" a scarcely concealed impatience was heard in the commander's voice.

"A mistake has been excluded, Comrade Commander. I checked the preliminary plotting once more," stated Rusakov firmly, not in the least doubting his correctness. The ship commander took a glance at the lieutenant and in a quiet voice ordered:

"Watch officer, take up the new heading. Call the operations duty officer."

Not so long ago a radiogram had been sent to the commander of the large ASW ship with the urgent instruction to get under way and proceed at full speed to a predicted point for meeting a target located hundreds of miles from there. Also indicated was the heading, by which he was to go to the area. And what do you know-- the young navigator, whose service aboard ship took up mere months of the cruise, proposed his own option which, in his opinion, would save several hours.

Of course it would have been simpler to take up the course indicated in the radiogram, and then, when the situation permitted, to turn onto the one recommended by the lieutenant. It is possible that this is what the commander of the ship would have done some months ago. But months of sailing had convinced him that one can count on Lt Rusakov....

Rusakov himself remembered well the day when, for the first time, he stepped onto the deck of this BPK. The officer of the deck met the lieutenant at the pier by the gangway. After looking the new arrival over benevolently, he said:

"You arrived at a most appropriate time. In a few days we are going to the Mediterranean and, judging by everything, for a long time. Your long cruise will start

from this dock, Comrade Lieutenant," he concluded with a smile. Then, holding out his hand:

"Let's get acquainted. The commander of the navigation department is Capt-Lt Aleynikov."

Anxiety descended at once on the young officer. The post to which he had been assigned had been vacant for a long time. And the electronic navigation group, without a commander, had become one of the laggards in discipline. He, Lt Rusakov, was faced with setting matters right within the subunit, to instill in the sailors confidence that they were capable of the highest goals.

Added to this were purely navigational concerns, which always are especially exacting before a cruise.

The score of days spent preparing for the cruise, which were filled with urgent and pressing matters, major and minor, flew by like a single day. But, on the other hand, they left in the lieutenant's heart a joyful sensation of participation in everything important: that the crew was experiencing these weeks.

Prior to passage of the straits zone, Capt-Lt V. Aleynikov invited him to his cabin. On the table, pilots' sailing directions and charts of the Bosphorus and Dardanelles Straits were spread out. The commander of BCh-1 proposed that his subordinate conduct a brief navigational meeting. At first this did not seem to Rusakov to be very complicated, for he had transited the straits zone more than once while still a cadet, and before the cruise he had again studied the rules of sailing and the narrows thoroughly. However, Aleynikov's scenarios almost put the lieutenant in a blind alley. As it was, the commander of the department had complicated still more an already complicated situation in the straits by adding a number of targets that were maneuvering dangerously and proceeding on collision courses. In conclusion, Aleynikov drew this conclusion:

"Not bad for a start. But you should recall that the navigator, like the chess player, should analyze the situation at least two or three moves ahead. Incidentally, your predecessor did not know how to do this, although he was, on the whole, a competent specialist. Fifteen years ago he would have been a good navigator. But today it is impossible to work the old-fashioned way."

The lieutenant was convinced of the correctness of these words shortly thereafter when he took up his post on his first independent watch. The situation was not very complicated, the deserted Mediterranean Sea had quieted down from the midday heat. Perhaps it was just from this feeling of calm and conciliation that Rusakov had not paid any special attention to the report of the lookouts:

"A dry bulk carrier on the starboard side, 10 degrees, distance 20 cablelengths."

The angry voice of the ship's commander brought the young lieutenant out of his reverie:

"Navigator, the course for passing this ship!"

"Comrade Commander, we will clear it cleanly, it is a safe distance to starboard."

"And how do you know, Comrade Lieutenant, that everything is in order on the dry bulk carrier right now and that the person at the wheel remembers the rules for steering and sailing? Perhaps there is no one at all at the wheel and they are proceeding on automatic pilot? Remember: the navigator should have a reserve option in every navigational situation."

Immediately the ample collar of Aleksandr's jacket seemed to be tight. For him to remind the ship's captain about the rules for steering and sailing--this seemed to be childish now to Rusakov. Cursing himself for sluggishness, he quickly computed on the maneuver board the necessary data and reported his recommendations. This was one of those lessons that were engraved in his memory for a long time.

The sailing went on for days and weeks, and along with them navigational experience and skill came to the lieutenant. Gradually, his authority also grew. Watching their energetic, demanding and competent commander, the sailors of the electronic navigation group became uplifted. And the pennant for victory at one stage of the competition was awarded to it for military duty.

And soon the ship's commander was given an occasion to be convinced that the skill of the navigator, Lt Rusakov, had grown. The large ASW ship was then carrying out a combat training task close to a NATO group of ships under an aircraft carrier. The situation was complicated to the maximum. The maneuvers of the NATO forces, which were not inhibited in their choice of bearings, had to be watched carefully. During these tense minutes a radar operator suddenly reported:

"The course is straight for the shore."

A tense silence reigned for a second in the pilothouse. According to the computations, there were tens of miles to the shore. Rusakov looked with perplexity at the ship commander, but he, as though he had not heard the alarming report, observed the maneuvers of the NATO ships through his binoculars.

Having felt embarrassed, the lieutenant again got down to the figures. It would seem that everything was correct, for the shore could not be seen. But a winding shore line was clearly displayed on the navigator's radar scope.

A conjecture struck him with simplicity and logic: dense clouds hanging low above the sea give such a return. His instructors at school reminded him repeatedly about this phenomenon, but this was the first time the lieutenant had encountered it in practice. A radar operator's report from another post confirmed Rusakov's surmise.

When he turned the watch over to Capt-Lt Aleynikov, the ship commander said:

"So now you are a navigator."

"...A Comrade Captain 3d Rank, operations duty officer, is on the line," was reported from the control department's command post.

The ship commander headed for the apparatus. Lt Rusakov did not hear what he said to the flag officer. Engaged in writing the navigation journal, Aleksandr did not hear the commander approach the table. He straightened up on hearing these words addressed to him:

"The flagship confirmed your option for the passage. I thank you for initiative and high skill!"

The BPK went to the area for meeting the target. Ahead were still many miles which he, Lt Pusakov, and the ship were to face in extended sailing. This was the path to high professional skill. That most difficult path which is begun from the lieutenant's berth.

#### Night Training on 'Khabarovskiy Komsomolets'

Moscow KRASNAYA ZVEZDA in Russian 16 Oct 81 p 1

[Article by Capt 3d Rank E. Chayka: "At a Shore Target"]

[Text] The ringing of bells resounded with noisy blows in the middle of the night. Sailors of the ship "Khabarovskiy Komsomolets" quickly took their places for station bells, and those in charge had bettered the norms in preparing for the battle and the target run.

Prior to giving the command to cast off, ship commander Capt-Lt P. Pantus ordered: "Observe blackout!"

The ship left the moorage wall completely darkened. Taking up a heading for the designated area, it soon dissolved in the night's gloom.

The sailors had to carry out an important firing at a shore target. The fact that it was performed in the concluding stage of the training year imparted a special slant to it. During the run, the crew struggled persistently for the "excellent" title. Painstakingly perfecting their military skill and striving to solve all their combat-training tasks with high quality, the servicemen step by step came closer to the intended goal. And now the time had come to carry out the last gunnery firing of the concluding year. Its results would go far in determining the results of combat training and the competition as a whole for the sailors of the "Khabarovskiy Komsomolets."

The first miles of the run became for them an authentic experience in combat maturity. The channel along which the ship had to be guided was complicated, and visibility was poor--all this required of the sailors increased vigilance and high control over each maneuver and each action.

A special load was placed during these minutes on the radar operators' command, which was under Seagoing Warrant Officer N. Kushnarenko. He had not served long in the fleet and did not have great experience. But to make up for it, the seagoing warrant officer did not lack for doggedness in achieving goals. The training year that was ended had been a real school of combat maturation for him. During it Kushnarenko had greatly increased his special training and had taught his subordinates much. And they were now working without failures and errors, and they accurately supplied the commander with all the necessary data about the situation.

Let's say a navigational obstacle has been encountered in the way of the ship. Kushnarenko's report about it followed. The ship's commander made a decision to maneuver, Pv 2d Class V. Makayuta, a first class helmsman specialist, skillfully executed it. The ship, leaving the obstacle to the stern, continued on its way.

Finally they had arrived at the designated area. The long-expected command to prepare the ship for the firing was sounded. The commander of the gunnery department, Lt V. Yakovlev, met it with excitement. His subordinates were to crown the work of the whole crew for the concluding year with well-aimed volleys. And the conditions for it were not of the best. The night's darkness had thickened increasingly, and a strong rain poured down....And now the signal "chemical alarm" was sounded. The gunners now had to operate in chemical outfits and gas masks. And this, naturally, hampered laying the weapon on the target and other operations.

But Yakovlev was agitated for no reason. The numerous drills of the gunners, during which the sailors had learned to operate in difficult weather, to carry out different unexpected tactical situations, could not help but be telling. In counting on operating under conditions close to those of combat, the sailors had created in the collective a good reserve of firmness, which enabled them to emerge from any test with honor.

The very first shell hit close to the target. Adjustments in the aiming data were made quickly. Volley!

The voice of the radio operator from the fire adjustment post was brought through the crackling of the ether after several moments: "It is covered! The target has been destroyed!"

Later it was clarified: more than enough shells needed for an "excellent" rating had hit the target. The sailors of the "Khabarovskiy Komsomolets" had taken still another very important step toward successful completion of the training year, and in winning the title of "excellent" ship.

#### Refueling from Tanker 'Irkt'

Moscow KRSNAYA ZVEZDA in Russian 21 Oct 81 p 1

[Article by Capt 2d Rank A. Zlydnev (Pacific Ocean): "On a Stormy Ocean"]

[Text] The ocean had not been encouraging with the weather. A powerful typhoon had been born off the Philippines and was moving friskily to the northwest, deeply plowing up the ocean's watery mass. Dark green waves with white foam on the crests rapidly tossed and turned the tanker, boiling fiercely, and rolling it from side to side. And so on without end. For 3 days running.

The tanker "Irkt" is an ordinary workman of the auxiliary fleet, which combat ships cannot get along without. And if this is so, then the tasks solved by the ship's crew also are related to combat tasks. They are complicated and responsible. The captain of the tanker, A. Shevelev, his first mate, Reserve Capt 1st Rank Yu. Sakhnenko, senior mechanical engineer Ye. Lintarev, and the other sailors understood that this was their work.

Their task during regular ocean sailing was to supply combat ships in exemplary fashion. As they had done repeatedly. At various latitudes. It is not by chance that the crew had been awarded the title, "Collective of Communist Labor and High Technical Sophistication." And it is not by chance that the Deputy Commander-in-Chief of the Navy had noted at the end of the training year that the tanker could be an example for imitation by other ships and vessels.

This is not so simple--to be an example. This means that it is always necessary to be in complete readiness for difficult work at sea. Regardless of the number of miles traveled and the weather. Regardless of the number of ships to be supplied.

This time there were three of them. They had requested fueling simultaneously. But the weather forecast for the next 2 days threatened serious disturbances. There was still another factor. There were many ships under NATO country flags around. Along the course and crossing it, and now and then NATO patrol aircraft were flying by. Everyone sensed that the NATO-ites were curious to observe how Soviet sailors are controlled while fueling while under way, under such complicated conditions.

"The transferring of the loads will be complicated," the voice of Capt Shevelev is relayed to the ship's posts. "We will supply two of the ship on the beam and one in the wake. Course and speed will not change. Are there questions?"

There were no questions.

The ships, meanwhile, had closed to the distance dictated by the length of the hoses, adjusted their speed to that of the tanker, and prepared to receive fuel and water. The "Irkut" also prepared itself. On its bright green deck the sailors in lifejackets were easily visible. They were heartily beginning to sound out the commands, experimentally cranking the enormous hose reels. The safe operating distance figures flashed on an electrical display board. A tall, strapping sailor, after loading the line-throwing gun, was readying for a well-aimed shot.

"Ready to transfer!"

"Ready to receive!"

The conversation was laconic. And the work was just as laconic. The line-throwing gun operated and the thin line had now been caught on the deck of the neighboring ship. The pipelines and the carrying cables were quickly fastened, and the durable hoses sagged above the waves.

As if it were not at all complicated. But the shirts of the executive officer, the electrical engineer, and the donkey pump operator were clinging to their backs, they were that warm. And the helmsman's knuckles had whitened--he had to press the wheel firmly so the tanker would not be put off course, would not begin to "roam," which could raise the fueling to fail. The speed of the run also must be held with meticulous precision.

It is clear that naval sailors would find it difficult without fine wire. There was not one hesitation, not one reprimand.

The fuel was going.

The water was going.

The ships "drank" leisurely but thoroughly. The way a man with a scythe drinks, one who has worked to his heart's content but is not going to rest, however, lest the mention grow up again,...

Shevelev allows himself to relax somewhat. He smiles affably at the ship commanders, invites them to be his guest, promising fruit dumplings.

"I can't, Fomich...."

"Thanks, Anatoliy Fomich...."

"Fomich, at some better time...."

And Fomich is 35 years old, and the other ship commanders, if not the same age, are just a wee bit older. But they call the captain by his patronymic. That means they respect him. And there is a reason for it. Sixteen years ago Shevelev began as a sailor in the auxiliary fleet. He was stubbornly grasping the salty, seafaring trade. Then he took as his start a tanker and he brought it up to be among the advanced ones in the fleet. Not he alone, understand, but he and the crew. Over all the oceans, except the Antarctic, he sailed. He unfailingly returned home with successes. With a feeling of having done his duty honorably. With an ineradicable striving to go again where naval sailors stand their watch indefatigably.

Just as rapidly as they had been received, the hoses were released and taken back.

"Thanks for the support!"

The ship commanders parted with these words. One after another the ships moved off to the side and took up their places in the cruising order. And to starboard a foreign observer flies along the side periodically.

Shevelev's face lights up with a smile, and he says merrily:

"I can tell by the flight whether there is disorder...."

The leading wave has become steeper, more biting. Bunches of heavy hoses, over which fuel and water will go to combat ships at any time, rock slightly.

The "Irkut" has conducted ocean service in good order during the training year that is being concluded.

#### PT Boat Training

Moscow KRASNAYA ZVEZDA in Russian 25 Oct 81 p 1

[Article by Capt 1st Rank N. Remizov: "In a Meeting Engagement"]

[Text] The simulator that is designed for checking PT boat operator training is ready for use. Its scope has already been lit up with red and blue lines. Here, close to the scope, at the simulator control panel, the supervisor of the exercise that is to be "played" against the enemy has taken his seat. And the staff for the cruise is arranged up against the wall. Here is division commander Capt 2d Rank V. Kireyev. Based upon the decision he has adopted, Vladimir Ivanovich Kireyev has begun to draw up his forces in battle order. One after another, commands are sounded from the improvised GNP [main command post] of the lead ship. The animated face of the Capt 2d Rank, who is rather short, thick set, and young in appearance, reflects inner concentration.

The missile boats, with the support of aircraft and attached forces, have entered into a confrontation with a grouping about equal to them in capabilities.

An exacting check of what the missile-boat sailors have learned during the year has started. Along with the division commander, boat commanders are being reported on as to their knowledge and tactical training. Among them are Capt-Lt V. Borisov and Capt-Lt P. Bondarenko, boat executive officers Capt-Lt V. Buryak and Sr-Lt Yu. Tabanaynen, and division specialists.

The combat episodes have begun. A reconnaissance in various directions is initiated. These and other forces use electronic-warfare equipment. Capt 2d Rank Kireyev is trying to lead the "enemy" in a false direction by a combination of several methods. At the same time, having distributed the reconnaissance forces rationally, he increased the number of sources of information.

Tactical group commanders, officers V. Borisov and P. Bondarenko, and officers of the staff are operating on the same wavelength as the division commander, taking his hints. Division navigator Capt 3d Rank E. Tomilov and division missileer Sr-Lt A. Pletnikov are actively studying the air and surface situations and are competently analyzing them. Movement data of detected targets are accurately determined and continuously refined.

The sailors make newer and newer plottings of target coordinates. Contact with the "enemy" has become increasingly close. It has been established that the targets are not false. A moment favorable for a strike from the air arises. Capt 2d Rank Kireyev declares a combat alert. And so the aircraft that are supporting the boats attack "enemy" ships.

But neither is the "enemy" sleeping, and he inflicts an answering blow from the air. Capt 2d Rank Kireyev skillfully organizes the repulsion of the attack.

The tensest moments of the training battle break out. A battle formation of one of the groups of "enemy" targets is discovered, and the elements of their movements are refined. The division commander makes the decision to strike the small targets with missiles. When the calculated distance is reached, the command "Launch!" is sounded. Kireyev now takes active measures here for screening and deception, in order not to give the "enemy" an opportunity to answer with precise launches.

Some losses could not be avoided entirely. These included a helicopter. But still success was on the side of the boat men. They won the complicated meeting engagement.

Now a critique was to be conducted with their group, and the remarks and evaluation of the supervisor were to be heard. Capt 2d Rank Kireyev, equipped with a pointer, justifies each decision for maneuver and use of weaponry and objectively evaluates the actions of each exercise participant.

The successes are mentioned briefly.

In examining the episode of "loss" of the helicopter, Kireyev admits:

"This was my error: I was late in raising the air cover. When the helicopter had brought the data, I should have sent it to the base."

\* \* \*

And here is what the exercise supervisor, Capt 1st Rank A. Matyushinskiy, said, in commenting on the running of the exercise:

"This is not the first time that I have checked the training of the boat operators at the end of the regular training year. This is not the first time I have met Capt 2d Rank V. Kireyev and his subordinates. And each time I am left with a good and encouraging impression after checking the exercising of this group. I see, first of all, Vladimir Ivanovich Kireyev as growing—he has an active, searching, work-loving nature. A constant, creative restlessness has enabled him to improve and to find better ways to use his forces in combat.

"The division's ships that Capt 2d Rank Kireyev has commanded during the current training year have carried out training tasks and combat exercises successfully. This collective distinguished itself in the best sense also during the check that we are talking about here. The decision that officer Kireyev adopted and the course itself of the training battle testify to the skill of the commander and his staff, who skillfully evaluated the situation, rapidly reacted to changes therein, rationally deployed their forces, and controlled them in the dynamics of the battle. After taking up a suitable position and having anticipated the direction of confrontation, Kireyev suffered incomparably fewer minor losses during the first battle clash with the enemy and later, not without success, tried to create conditions suitable for himself, imposing his will on the 'enemy.' It is also valuable that during the critique the officer objectively and critically analyzed the actions of his team, and, without beating around the bush, pointed out omissions and miscalculations, not excluding his own."

\* \* \*

The cutters received a high evaluation for the final check. It crowns their efforts deservedly in the drive for successful completion of the training year and for full fulfillment of competition commitments.

#### Errors in Air Defense Training

*Vosma RAS'JAYA ZVEZDA* in Russian 28 Oct 81 p 2

[Article by Engr-Capt 2d Rank B. Kuleshov: "Not According to the Scenario"]

[Text] The missileers of the large ASW ship "Stroyny" was preparing to go to sea to repulse an "enemy" air raid. During a training session, which was being conducted under the supervision of the officer in charge, the appearance of two low-flying targets was assumed. The commander of the missile-gunner unit (inch-2), Capt-Lt A. Kuts, set the appropriate tasks for his subordinates on the eve of the training session.

And now the session has started. During its first stage, Capt-Lt Kuts, working under full strain, succeeded not only in monitoring the readings of the numerous instruments, took reports, and gave orders to his subordinates, but he also constantly kept an eye on the search radar scope. The officer presented the tactical situation and the nature of the probable actions of the opposing side accurately enough and he knew the capabilities of his equipment and weaponry. On the whole, this

also permitted him to guess the "enemy's" maneuvers and to suggest to the search radar operator what must be done to intensify observation over that section where the most powerful electronic interference was being displayed.

The ship's specialists undertook to track low-flying aerial targets at the maximum distance, despite the difficulty of detecting them. Victory, it seemed, was close. But the supervisor of the session, unexpectedly for its participants, increased the number of aerial targets and complicated the tactical background with several additional scenario items. For example, one of the main targets that the operator had begun to track at maximum range had disappeared. The unit's specialists should have been guided in this situation by the way things were going and started to track an additional, a third aerial target. It is this which can complicate the situation in modern naval battle. But at this important moment Capt-Lt Kuts committed a tactical miscalculation, which brought on other errors.

When the detection of additional targets was reported, the officer did not at once attribute importance to this, and he did not order that they be tracked. And when he looked into the situation, the subordinates did not manage to reorient themselves. In brief, Capt-Lt Kuts proved that he was not ready for a sharp change in the tactical situation.

What was the reason for this contrast in actions? One cannot assert that during the session the officer had consciously disregarded the report about the third target, knowingly selecting a simplified option for the operation. Although, of course, it does happen this way when some commanders try to obtain a high mark without special work. But in this case, a dissimilar degree of the officer's readiness to supervise the team in situations that differed in complexity had been manifested.

Let us return to the first stage of the session, when the unit commander acted extremely accurately. On the eve of the session being conducted, the officer had been helped in no small degree by a briefing by a staff officer. Capt-Lt Kuts and the officers subordinate to him studied attentively the elements of ship maneuvering that had been plotted on the tracing paper and received specific instruction on how to destroy aerial targets under such circumstances. Some words also were said about the fact that the situation could be changed. Just that. But indeed, the staff officer, having this experience, was obligated to share it with the officers and to arm the missile groupings that employ initiative, whatever the situation that might take shape.

But this did not occur. As a result, Capt-Lt Kuts could only suppose in the best case that an unexpected unusual situation had arisen. And he was not prepared for it. And he was ready to carry out as well as possible only the specific recommendation expressed by the staff officer. Kuts had studied and, based on the information and the methods of probable maneuvering of the aerial "enemy" that were obtained at the briefing, had organized an exchange of experience in the unit.

In other words, the officer was limited to an older known, strictly defined condition, i.e., configuration operation according to a previously developed scenario. And, within the circumstances of this permitted it, it enabled him to carry out much of what was required, prior to the complication of the situation. Finally, the officer would have worked more confidently, even during the second stage, when the situation became complicated, if he had been psychologically attuned to this from the moment given by the staff officer.

One should not draw the conclusion from what has been said that the subunit commander has not been made answerable for anything. In those questions that touch on preparation for a training battle, the officer should manifest greater self-sufficiency. For weaponry has been entrusted to him. Demands are made on him. And demands are made at times on unit commanders who are clearly inadequate.

For example, a tactical task for the specialists of a unit was developed on a ship on the basis of the appropriate documents and experience in preparation for firings. At one time this task enabled the procedures for developing operational skills to be improved and helped to achieve precision in interactions and coordination of the team as a whole. But it had been developed, as is said, for classic conditions, and now it is already obsolete in some degree. Why would a commander of a unit not continue this interesting and necessary initiative and not improve the given task for raising the quality of the practical training session under diverse tactical conditions? Of course, all this requires both time and creative efforts. But the yield will not be small. Since the training of missileers to repulse aerial targets would prove to be effective, let them work out their actions in various situations and not according to the pattern established on the ship.

The facts indicate that such a pattern does exist. It happens that in the course of a day the specialists of a unit manage to combine an innumerable number of simulated targets. The speedy and the superspeedy, for instance. In developing primary operational skills, there is a definite advantage from this. But to abuse it is forbidden: the combining is worked out without creating a complex tactical background and it habituates sailors to operations under ideal conditions.

But life is convincing that it is necessary above all to conduct each drill against a complicated tactical background in an environment of "enemy" counteraction. And it should be very prudent to include that experience that has been gained during combat training. A study and generalization of it will make it possible to assess the level achieved, to see the weak points in the training of the teams, and to help in well thought out planning for the training of personnel. A monthly summing up of the results of perfecting the standards that are reflected in a special journal is an approved way for evaluating growth in the sailors' training. But the commander of the unit, during the training year that is being concluded, also neglected this possibility for increasing the effectiveness and quality of combat work.

The training session conducted at sea on repulsing an "enemy" aerial flight taught much to the missile gunners unit's specialists. For Capt-Lt Kuts it was a serious test of tactical maturity, and it suggested that one must not be soothed, that it is necessary each day to persist in improving one's skills and the training of subordinates.

From this lesson, practical conclusions should be drawn on the ship and in the unit, and later sessions at sea should be prepared more carefully. In the remaining days of the training year that is ending, and during the new training year, it will be necessary to use intensely each mile of cruise and each exercise at the base for raising tactical skills.

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BOOK REVIEW: EFFECTIVENESS OF TARGET DETECTION

Moscow MORSKOY SBORNIK in Russian No 2, Feb 81 (signed to press 30 Jan 81)  
pp 94-95

[Article by Capt 1st Rank (Res) I. Smirnov, Doctor of Technical Sciences:  
"A Timely Work on the Problem of Target Detection"]

[Text] The rapid development of the means and methods of waging warfare at sea, and especially of underwater and air attack weapons, makes the problem of the timely and effective detection of targets especially urgent. It has both a theoretical and a practical side. Required for its solution are an exacting scientific approach and comprehensive analysis.

Methodological aspects of evaluating the effectiveness of target detection materiel and observation systems applicable to tasks of instrument and tactical search are discussed in detail in the book by V. Gorbunov 'Effektivnost' otsnuzhdeniya tseley'<sup>1</sup>. It should be emphasized that the author has been working long and persistently in this area. In its time a book written earlier on this same theme<sup>2</sup> by him together with A. Afanas'yev generated great interest. The book was extensively used (and is still being used) and not just by naval readers. However, the earlier book dealt only with aspects of instrument search.

The new book on target detection has an applied science character. Even though the author includes many formulas, graphs and diagrams, the mathematical information does not overload the book. The material is set forth in sufficiently popular form and is understandable to a wide circle of naval readers.

The first pages are devoted to principles of an approach to evaluating the effectiveness of the accomplishment of tasks of target search and detection when using various types of reconnaissance and observation materiel and systems, both fixed (stationary) as well as mobile. V. Gorbunov analyzes evaluation criteria in detail, showing that the proposed approach is based on the independence of events for establishing tactical and instrument contacts (the first is determined by the moment of entry of the target into the operational zone of the observation or reconnaissance means, and the second -- by the moment of the positioning of the target which is already located in the given zone, that is, the moment of its detection. In practice such an approach can be considered completely valid, and the author, emphasizing this, presents the basic concepts and definitions for a theory of target search and detection.

Discussed in detail in a special chapter are methods for estimating the anticipated range of operations of the means of observation. Along with analytical methods, set forth here is a method for the statistical probability description of the anticipated range of operations, based on experimental data and which makes it possible to obtain more reliable estimates.

The next two chapters are devoted to the methods and models which make it possible to evaluate the effectiveness of establishing tactical and instrument contacts under various conditions of a situation. Substantiated here are some quantitative and qualitative characteristics of various search situations. The provided characteristics can be used extensively in engineering and tactical calculations.

In the concluding chapter, based on the preceding material, there are discussed some methods for calculating and evaluating the effectiveness of multiple element observation systems.

It cannot be said that the book is free of shortcomings. In our view little attention is devoted to the optimal establishment of instrument and tactical contacts. More examples should have been given. Designations are not uniform. For example, the mathematical expectation for detection range is sometimes designated  $m_x$  (section 2.2), sometimes  $M[R]$  (section 3.5) and sometimes just as  $m$  (section 5.5). However, all of this does not reduce the value of the author's timely book.

An extensive bibliography is provided at the end of the book. One point attracts attention. Included in the list of literature are articles from MORSKOY SBORNIK on aspects of target detection. The latest is from 1975. It appears that the journal should direct its attention to this very important and topical subject more often.

#### FOOTNOTES

1. V. A. Gorbunov, 'Effektivnost' obnaruzheniya tseley" [Effectiveness of Target Detection], Voyenizdat, 1980, 160 pp, 12,000 copies, price: 60 kopecks.
2. A. A. Afanas'yev, V. A. Gorbunov, 'Effektivnost' obnaruzheniya tseley radiotekhnicheskimi sredstvami nablyudeniya" [Effectiveness of Target Detection With the Use of Radiotechnical Means of Observation], Voyenizdat, 1964.

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## MILITARY SCHOOLS AND ACADEMIES

### HEAD OF NAKHIMOV BLACK SEA HIGHER NAVAL ACADEMY ON PHYSICAL EDUCATION

Mowcow SOVETSKIY VOIN in Russian No 16, Aug 81 (signed to press 27 Jul 81)  
pp 14-15

[Article by Vice Admiral Stepan Stepanovich Sokolan: "The Ocean Likes the Strong"]

[Text] The Black Sea Higher Naval Academy imeni P. S. Nakhimov has good traditions in educating competent and spiritually and physically strong naval officers. In the last 2 years the Academy emerged as the champion in the Spartakiads of the nation's higher naval educational institutions. The editors asked the head of the Academy, Vice Admiral Stepan Stepanovich Sokolan, to describe its experience in organizing mass sports activities there.

The nature of present-day military service, especially naval service, is such that most of its tasks have to be accomplished under considerable physical and mental stress. All forms of combat activity on surface and underwater vessels, torpedo boats and aircraft, as well as prolonged sea cruises require considerable exertion of effort and will, special physical endurance and hardiness, superior motivation, mastery of nautical skills and habits, motor coordination and rapid and appropriate reflexes.

It is no secret that sometimes troops express the opinion that, owing to the tremendous changes in the material and technological equipment of our army and navy, they no longer have to make arduous physical exertions or display a high degree of physical fitness. It is being said that now knowledge and technology, rather than physical strength, solve everything. Experience shows that this is a gross misunderstanding, stemming from poorly organized combat training and occasional "hothouse" [sheltered] conditions of service.

The commanding officers, the political department and the party and Komsomol chapters at our Academy devote unflagging attention to the physical hardening of future naval officers. We are concerned that morning exercises, planned physical education and mass sports activities be conducted in an organized, methodologically literate and energetic manner, since they are the principal means of strengthening the health of the students and developing their endurance, strength and dexterity. They are, so to speak, the three whales which support all our work on physical fitness and sports.

Morning exercises are of special benefit to the students. They have become the means of daily purposive work to toughen the future naval officers. Our approach to these gymnastics is differentiated. Thus students in the first to third years are expected to perform four exercises No 4 and one exercise No 2 each week. This means that our students do field and track exercises four times a week and practice with gymnastic gear once a week. The fourth- and fifth-year students perform exercise No 4 three times a week and exercise No 2, two times a week. These exercises include, on a year-round basis, rowing in six-oared boats plus swimming in the summer.

It can be said without exaggeration that such morning exercises contribute to strengthening the students' health, developing a large number of physical qualities and meeting VSK [All-union Sports Committee] standards as well as qualifying for athletic categories.

During the new school year the academy began to develop exercises recommended by the new regulations on physical education. The future naval officers were especially interested in such applied military exercises as rope climbing, integrated exercises No 1 and No 2, 100-meter swim in uniform, 10x10 shuttle races and mastering an obstacle course. Such exercises develop speed, spatial orientation and motor coordination, and they contribute to strengthening the vestibular apparatus.

Special attention is devoted to the physical fitness of last-year students. We took steps to have all such students participate in athletic contests. The results of these purposive attempts are evident: now all last-year students have earned first-degree VSK badges and all have qualified for the first or second athletic categories.

Of the 50 honor students graduated last year from our Academy, 30 were members of various varsity teams at the Academy, Masters of Sports, candidates for Masters of Sports and category-one athletes. The students A. Gorev and V. Savin, who had graduated with a gold medal, also had varied athletic skills. Gorev is a candidate for Master of Sports in Marine Multiple Sports Events; he is a category-one oarsman and weightlifter, and a 3-km militarized cross-country racer. Savin is a category-one volleyball player, weightlifter and oarsman. Both these graduates already are lieutenants. We receive only expressions of gratitude for bringing up such excellent officers from the fleets in which they serve.

About 60 percent of our 1980 graduates have been awarded the gold badge of the Military Athlete. Such a badge is awarded only to those military personnel who for 5 years in a row meet grade-one VSK standards. The criterion is difficult and can be satisfied only by those who do physical exercises on a daily and devoted basis, not occasionally.

This year's graduates, too, will include quite a few possessors of the gold badge of the Military Athlete. Among them will be the honor students candidates and Masters of Sports in Free-Style Wrestling, Chief Petty Officer Aleksander Kushnarev and Chief Petty Officer Sergey Shkabarin, the Candidate for Master of Sports in Swimming, student Andrey Tarasov and many others. We have quite a few students who qualified for category one in several different kinds of

sports--students such as Igor' Seliverstov, Master of Sports in Multiple Officer Events, category-one oarsmen and 3-km militarized cross-country race, or Sergey Bushuyev, category-one free-style wrestler, weightlifter and oarsman.

We could be satisfied with our accomplishments, but we decided to go even further and attain a situation in which at the end of his third year every student at our Academy would qualify for the first category in rowing a six-oar boat. Why precisely rowing? The reason is simple: rowing is the most important type of sport for naval personnel, since it helps to develop skills in controlling a boat under varied weather and navigational conditions and promotes endurance; it accustoms students to the sea and to naval service. At the Academy no day of leisure passes without a rowing contest. The contestants display much passion, enthusiasm, ardor and an urge to reach the goal first. And it's no wonder, because the winners become members of the Academy's varsity rowing team--the team which for the last 2 years in a row won the championship at the Spartakiad of the nation's higher naval educational institutions and, in addition to the awards, received the right to the honored title of USSR Master of Sports.

But that is still not all. Our goal will be that every one of our graduates should, on leaving the Academy behind, qualify not only for the first category in rowing but also for the first category in some other sport. That is, our goal will be that young officers should have broader training in different sports. Of course, we are quite aware that such a goal is difficult to attain. But we believe that it is attainable.

The Department of Physical Education and Sports at our Academy, which is headed by the experienced educator and athlete Master of Sports in Gymnastics, Lieutenant Colonel S. Zemskiy, includes superior experts who are capable of passing on to students all of their experience and their entire arsenal of techniques, applicable to different types of sports, which they have mastered to perfection. They include Major B. Makeyev (Master of Sports in Boxing), Lieutenant Colonel V. Kabanenko (in the past Candidate Master of Marine Multiple Events and Skiing, and Various Sports Contests), Lieutenant Colonel Yu. Belousov (Master of Sports in Underwater Orientation), Major B. Tsygun (Master of Sports in Water Polo), Captain A. Bugayenko (Candidate Master of Sports in Soccer) and others. Each year prior to the beginning of the school year, the department works out target criteria (for each course separately) for training future bearers of the VSK badge and category-one or two athletes. These targets are invariably met.

In the fall of last year an experiment began at the Department of Physical Education and Sports: sports specialization was introduced with third-year students. Let me describe briefly what this means. Our students devote 3 hours a week to physical education. This is in addition to the intensive morning exercises and their leisure-time participation in sports. Thus, during the first 2 years a solid physical basis is established, and students who are the beginning of their third year have passed the physical education program are entitled to choose one of the sports sections included in the specialization program. Such sections include: boxing, free-style and Greco-Roman wrestling, unarmed self-defense, judo, karate, light athletics, volleyball, basketball, soccer. A special General Physical Education group (GPE) has been set up for students who do not satisfy the requirements. Members of this group may take qualifying tests for admission to any of the above sections; they can be admitted only if they pass these tests.

What has the introduction of this specialization produced? First, students have become more interested in exercises, because they have the right to select the sport they prefer and thereby meet increased physical challenges during their training. Second, the future naval officers learn how to be sports coaches so that during their future service on ships and in troop units they can independently train and exercise their own staff. And lastly, one more advantage: during the 3 years that such students have yet to spend at the Academy, they can qualify even for the degree of Master of Sports in the sport they elect. All depends on the persistence of the student himself.

Although this is only the first year that specialization has been introduced, it has met with the ardent approval of our students. Now they try to attend training in their particular favorite sports sections even during their free time.

Nevertheless, now and then skeptical voices are heard. It is said that it is impossible for every graduate to attain the first category in more than one type of sports (one of which is, I repeat, rowing). After all, boys with poor prior physical training sometimes come to the Academy right off the school bench. How can they be made over into athletes?

True, it is no sin to reveal that the regular academic school as yet pays little attention to the physical hardening of its students. Sometimes when you look at recent graduates who are taking the entrance exams to our Academy, you cannot believe what you see: they may be bright and solve mathematical problems with ease, but they collapse the second time you ask them to perform a horizontal-bar exercise. Such instances are quite numerous. Let me cite just one: Sergey Revin and Vladimir Rodak were admitted to our Academy. On the exercise field they stood out like sore thumbs among the other students: they could not do anything and knew nothing. In a word, they were weaklings. But as their graduation approached, the former little boys turned into strong, dexterous, bold men. Both Revin and Rodak won first-degree VSK badges and became category-one oarsmen and weightlifters. Now they already are officers and serve worthily.

I think that the above fact is the most convincing proof that we shall fulfill with honor the task we undertook. I repeat, this is a responsible task but for this very reason it is twice as much honorable.

A major role in the physical hardening of students is assigned to mass sports. Last spring the 33th Spartakiad, devoted to the 26th CPSU Congress, ended at our Academy. We conducted it in three stages. During the first stage the different graduation classes competed for priority in performing VSK exercises, with obligatory participation by all personnel. During the second stage the classes competed for departmental priority, also with obligatory participation by every student; the scope of contests was complemented with game-type sports--soccer, handball, volleyball, basketball. And lastly, during the final third stage of the Spartakiad, the class and department varsity teams competed for priority in the Academy.

Varsity teams from our Academy regularly participate in various municipal, garrison, fleet and oblast contests. And often it is precisely our students who win the right to stand on the pedestal of the first or second winner. This is demonstrated by the huge display stand in the lobby of the academic building, decorated with numerous trophies pointing to the great successes of the Academy's athletes.

Our students can attend 20 different sports sections. Last year alone 21 Masters of Sports were trained at our Academy in mostly applied military types of sports, such as rowing-and-sailing multiple events, officer and marine multiple events and underwater sports. But masters of other sports also are represented. For example, our graduate Aleksey Zabavin is a member of the representative teams of the Navy, the Ukrainian SSR and the USSR Armed Forces, as well as a Master of Sports in Rifle Practice; Chief Petty Officer Aleksandr Surkov is a Master of Sports in Checkers (incidentally, he is also a first-category oarsman and weightlifter) and first-year student Sergey Pernak is a Master of Sports in Swimming.

Sports enrich men with many physical qualities. But in addition to dexterity and strength, they also enrich men with such qualities as boldness and resoluteness, and they temper character and will. Once a student of ours, Petty Officer First Class Sergey Yakovlev, while on home leave, happened to walk on a seashore. Suddenly he heard cries for help--someone was drowning. Sergey unhesitatingly hurled himself into the water and rescued the man. The rescue was later written about in the local newspaper. Or another instance: the Academy received a letter from the commander of a troop unit to which the student Yuriy Nazarov was assigned for service. The commander commended Nazarov for active and decisive action in putting out a fire.

Why have I cited these two episodes? The point is that both Yakovlev and Nazarov are good athletes, bearers of first-degree VSK badge, category-one athletes. Yes, during those critical moments when they performed their noble deeds, other people were present. And doubtless others would have come to the aid of the drowning man and of those who were putting out the fire. But the reaction of the athletes proved to be more rapid. In practice it took them a fraction of a second to arrive at a decision. These precisely are the qualities suited for future officers in combat.

Naval equipment and weapons are improved each year, and increasingly responsible tasks are assigned to young lieutenants. Our navy has long since emerged onto the expanses of the world ocean. And the ocean likes the strong. The level of the physical hardening of an officer greatly affects his various professional qualities and habits. In the final analysis, it determines the ability of the specialist or commanding officer to perform his duties in a clear, exemplary manner during prolonged cruises or the performance of combat tasks. Hence, the advances in naval technology should be constantly accompanied by advances in the physical training of the naval personnel who operate complex equipment and weapons.

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PERCEPTIONS, VIEWS, COMMENTS

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Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 1-2

[Full-text translated articles published in this JPRS report are indicated with an asterisk; excerpted articles with a double asterisk.]

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British Chieftain-Mk5 Tank/Guided Missile Frigates of NATO Country Navies/  
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Articles by Soviet authors and the chronicle have been prepared from foreign press materials. The issue used illustrations from the "Jane's" Reference, the pamphlet "British Army in Germany," the book "British Army Today and Tomorrow" and the journals: AVIATION WEEK AND SPACE TECHNOLOGY, ARMADA INTERNATIONAL, ARMIES AND WEAPONS, BATTLE, DEFENSE, SOLDAT UND TECHNIK, INTERAVIA, NATO'S FIFTEEN NATIONS, NEWSWEEK, NAVY INTERNATIONAL, FLIGHT, SPIEGEL, AIRE ET COSMOS, AIRSPACE JAPAN and AIR FORCE.

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PERCEPTIONS, VIEWS, COMMENTS

SOVIET COMMENTS ON U.S. STRATEGIC MOBILITY CAPABILITIES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 7-12

[Article by Capt 1st Rank A. Korablev: "Assuring Strategic Mobility (Air and Sea Movements of American Troops)" Passages enclosed in slantlines printed in bold-face.]

[Text] The documents and materials of the 26th CPSU Congress emphasize the abrupt rise in aggressiveness of the politics of imperialism, and American imperialism above all, which reaffirmed its desire to retard the process of social and political changes in the world and which is attempting to play the role of world gendarme and unique guarantor of the international system of exploitation and oppression with even greater adventurism.

Recent events indicate stepped-up military activeness by U.S. imperialist circles, which declared entire regions to be the "sphere of their vital interests." They wish to dominate everywhere, they intervene in the affairs of other nations, they violate their legal rights and sovereignty unceremoniously, and they attempt to impose their own will on states in many parts of the world.

The global nature of American imperialism's aggressive aspirations "demands the military presence of U.S. Armed Forces" in different parts of the globe and so the country's military-political leadership views them as "an instrument of U.S. national policy." To achieve its expansionistic goals, the Pentagon has set up a network of military bases and strongpoints abroad, stationed major troop groupings in practically all important parts of our planet, activated a strong strategic reserve on its territory in the form of a unified Readiness Command, and set up and continues to increase the size of interventionist "rapid deployment forces."

The foreign press has noted that plans for rapid reinforcement of U.S. military contingents stationed on the territories of other states determine the special attention the American command gives to increasing the strategic mobility of its Armed Forces, and above all the strategic reserve, which includes combined units and units of regular ground forces and the Air Force Tactical Air Command, stationed in the continental United States.

Western military specialists take strategic mobility to mean a capability for rapid movement of units and combined units to foreign TVD [theaters of military operations]

for reinforcing troop groupings deployed there or for setting up new ones, as well as for their logistical support. In the opinion of the American command, such mobility is provided by a number of factors, the primary ones considered to be availability of a sufficient number of means of air and sea transportation meeting modern requirements; creation of a developed system of ports, airfields, railroads and highways on the territory of the United States and probable TVD's; maintaining high combat readiness of strategic reserves, especially "dual based" combined units and units; and the prepositioning of reserve supplies in various parts of the world. This article briefly examines the status, development prospects and selected features of air and sea transport intended for giving the U.S. Armed Forces strategic mobility.

In evaluating the probable nature of combat actions in the European Theater of War as well as results of exercises conducted in recent years by the American Armed Forces, the Pentagon leadership is planning to move reinforcing troops and military cargoes from the United States to Europe primarily by aircraft of the Military Airlift Command [MAC] and vessels of the Military Sealift Command [MSC], with extensive use of the personnel and resources of civilian airlines and the Merchant Marine.

*/Air movements./* Taking account of the experience of the latest wars in the Near East, the American command now is paying particular attention to increasing capabilities for delivering troops and cargoes by air, since aircraft are capable of transporting them over great distances in minimum periods of time, although they have relatively limited load capacity and limited size of the cargo compartment.

As of early 1981 MAC numbered over 600 aircraft, including 315 heavy strategic military transports (of which there were 74 C-5A's and 241 C-141's) and 276 C-130 medium military transports. In the opinion of Department of the Air Force leaders, under certain conditions these means will not be able to satisfy the Pentagon's requirements fully for moving personnel and weapons. For this reason there are MAC reserves, which include units and subunits of the Air Force Reserve command (248 tactical transports), the Air Force National Guard (166 aircraft), as well as a considerable number of heavy (wide body) aircraft of civilian airlines (counting the aircraft earmarked for movements within the United States, this reserve includes 373 Boeing 747, DC-10, DC-8 and other cargo and passenger aircraft).

The military transports in the MAC inventory (Fig. 1) [figure not reproduced] have the following performance characteristics. The C-5A Galaxy can take aboard 120 tons of cargo or 345 servicemen with personal weapons, or two M60 medium tanks. Its maximum take-off weight is 348.8 tons, with a cruising speed of 815 km/hr at an altitude of 9,000 m, a service ceiling of 10,300 m with a flying weight of 280 tons, and maximum range of some 6,000 km with a cargo of 100 tons. As reported by the foreign press, operation of the C-5A showed that its actual flying life proved considerably below that estimated (17,000 hours instead of 30,000). In the opinion of American military experts, the service life of this aircraft can be extended by installing a modernized wing (the aircraft with the new wing presently is undergoing flight tests). They believe that after such work is done the aircraft will be able to carry a full load (120 tons), but its load capacity presently is restricted to 90 tons.

The C-141A Starlifter military transport can take aboard 42 tons of cargo, or 154 soldiers with weapons, or a light tank. Its maximum take-off weight is 143.6 tons, with a cruising speed of 800 km/hr at an altitude of 9,000 m, a service ceiling of

12,200 m, and a maximum range of approximately 6,560 km with a load of 32 tons. Believing that the C-141A's potential capabilities have not been used fully, the American command decided to modernize it. The essence of this is approximately a 30 percent increase in the cargo compartment size by lengthening the fuselage and installation of aerial refueling equipment. The modernized aircraft (designated the C-141B) has a maximum take-off weight of 156 tons and can carry large-size cargoes with the very same payload. The American press emphasizes that modernization of the entire inventory of C-141 aircraft is the equivalent of building 90 new C-141A aircraft.

The C-130 Hercules medium military transport takes aboard 92 soldiers with personal weapons, or 20.4 tons of cargo (8-10 tons for transoceanic movements). At the present time a new version--the L-400 Twin Hercules--is being developed on the basis of the Hercules.

The KC-10 tanker, which will be used both as a heavy military transport and as a tanker aircraft, has been created in the United States to increase the effectiveness of using military transports to move troops and combat equipment over long distances and has begun to enter the Air Force inventory. In the cargo version with a maximum take-off weight of 268 tons and fuel capacity of 80 tons, it will be able to carry 77 tons of cargo over a distance of 7,000 km and, in the tanker version with the very same take-off weight, to transfer 117 tons of fuel to other aircraft at a range of 1,850 km and return to base. Judging from American press reports, the Air Force command is purchasing over 30 such aircraft.

In planning use of the aircraft inventory of civilian airlines, the Pentagon is allocating funds to them for work to adapt commercial aircraft for carrying military loads (reinforcing the cabin floor, widening the cargo compartment and so on).

The foreign press notes that the United States also is performing intensive research to develop the new S-X strategic military transport. An aircraft with maximum take-off weight of approximately 180 tons is mentioned as one of the versions of the future aircraft. It will be able to accommodate 60 tons of payload and will move not only personnel with weapons from the United States to foreign TVD's, but also heavy, large-size loads including the new M1 tank. One of the main requirements being placed on the S-X aircraft is its capability to operate from dirt runways.

Taking account of the capabilities of the U.S. Air Force military transportation means, foreign specialists assert that moving the 82d Airborne Division, for example, will require 800 trips by the C-141 aircraft. Based on the experience of Reforger exercises, which practice the movement of "dual based" combined units from the United States to Europe, it was planned to make 10-12 trips with the C-5A aircraft and up to 130 with the C-141 to move up to 12,000 personnel (without heavy weapons or equipment) and 1,500 tons of cargo, which required 6-8 days with average rates of flying. In one such exercise in 1978 four heavy Boeing 747 aircraft of the civilian airline TWA were used for the first time to carry over 600 persons and some 70 tons of cargo in troop interests. A trend was manifested in the latest exercises (Reforger-13, Team Spirit-81 and others) to use aircraft of civilian airlines primarily to move personnel, and MAC aircraft to move weapons and certain kinds of combat equipment.

/Sea movements./ To assure strategic mobility Pentagon leaders deem it advisable to make extensive use of sea transportation (chiefly for moving heavy weapons and equipment) along with air transportation. Deep-sea vessels are capable of accommodating cargoes of practically any weight and size, but their delivery speed is many times below that of aircraft. And so in planning troop movements to foreign TVD's, the American command tries to compensate for the shortcomings of one kind of transportation with the advantages of another.

As already noted, responsibility for sea movements lies with the MSC. The foreign press has reported that it has two groups of vessels: those belonging directly to the Navy or which are owned by the state, and those chartered from private shipowning companies. The first group comprises the basis of the MSC's means of transportation and the latter group is its variable part, the make-up of which can change sharply depending on the situation at hand.

An increase in the MSC's means of transportation occurs by making vessels of the National Defense Reserve Fleet operational (this fleet is under the control of the Maritime Administration of the Department of Commerce), and by chartering vessels of the U.S. Merchant Marine. Judging from foreign press reports, their deliveries for the MSC are regulated by a special agreement concluded between the U.S. departments of defense and commerce, which establishes the sequence for using vessels for military purposes under extraordinary conditions.

In figuring the means of transportation which might be assigned to the Navy for assuring strategic mobility, American naval specialists point out that the Military Sealift Command has approximately 70 vessels of various classes and purposes, over 350 from the National Defense Reserve Fleet, and some 300 can be assigned from the Merchant Marine. But they stress that by virtue of certain circumstances the MSC can count on only 12 organic cargo vessels, 38 transports for charter in the Merchant Marine and 161 vessels from the National Defense Reserve (all of them are suitable for carrying large-size cargoes) in 1981.

American specialists believe that Ro-Ro class transports (with a horizontal method of loading and unloading) as well as LASH Class lighter-carriers and Seabee Class barge carriers meet Navy requirements to the greatest extent.

The foreign press notes that Ro-Ro Class transports are intended for moving all kinds of wheeled and tracked equipment presently in the Ground Forces inventory. The vessel has a displacement of 24,500 tons, a speed of 26 knots, load capacity of 12,000 tons and cargo deck area of 15,330 m<sup>2</sup>, which permits accommodating up to 750 tanks, APC's and other equipment.

LASH Class lighter-carriers are used for moving shallow-draft barges (with a draft of 1.8 m and load capacity of 350-800 tons). Such a vessel can take aboard a total of some 80 barges. It also can be used to carry containers, wheeled equipment, helicopters, packaged and palletized cargoes and so on.

Each Seabee Class barge carrier can take 38 barges with a load capacity of 830 tons each, helicopters, and other equipment. It is noted that they are refitted rather easily as Ro-Ro Class vessels.

In the opinion of foreign specialists, the U.S. merchant fleet presently does not have enough vessels for complete support to military movements in wartime. In

connection with this, the United States has drawn up a ten-year program for building 300 vessels of various purposes (container carriers, universal transports, barge carriers and others). When the new vessels are constructed the government pays the shipowners' expenses connected with satisfying the Defense Department's requirements that ships being newly built must be suitable for moving military cargoes and have a large endurance and a speed of at least 20 knots.

The foreign press reports that the United States has developed the design of a multipurpose vessel with a load capacity of over 25,000 tons which is to have qualities making it suitable for use both in merchant shipping and for military purposes (as a transport for wheeled and tracked equipment, as a conventional dry cargo vessel, as a container carrier, or as a floating heavy weapons depot). Its loading and unloading equipment makes the vessel independent of the availability of port equipment. It is assumed that the new means of transportation will increase mobilization capabilities of the U.S. Merchant Marine considerably.

The American command makes active use of transport vessels in numerous exercises in testing plans for strategic troop and equipment movements. For example, during Exercise Reforger-10, the transports "Admiral Callaghan" (Fig. 2) [figure not reproduced] and "Comet" carried over 50 medium tanks, around 120 Army Aviation helicopters, 30 APC's, 1,000 vehicles and trailers, and up to 300 containers with military cargoes. The sea passage from the port of embarkation at Beaumont (United States) to ports of discharge at Ghent (Belgium) and Rotterdam (the Netherlands) took 16 days.

In order to assure strategic mobility, Pentagon leaders deem it advisable to make integrated use of air and sea transportation for moving combined units and units to foreign TVD's. The air fleet is assigned missions of moving personnel and urgent cargo, and the sea fleet the mission of carrying heavy weapons and equipment. For example, some 13,000 servicemen and over 37,000 tons of cargo were delivered by the combined method in the aforementioned exercise. It follows from a recent statement by the CIC of the "Rapid Deployment Force" that the first battalion of the airborne division can be delivered to the Persian Gulf by military transport aviation 48 hours after declaration of an alert, and air movement of the entire division will take two weeks. One more division will arrive there by sea in 30-35 days.

Bringing down a flurry of fabrications about the imaginary "Soviet military threat to vital interests" of the imperialist camp and about the notorious "helplessness" of the NATO bloc, the American military press considers it necessary to accomplish the following urgent measures for increasing capabilities of providing for air and sea movements:

- Complete the modernization of C-5A and C-141 aircraft and accelerate development of the C-X new generation military transport aircraft;
- Increase the inventory of wide body aircraft in the civilian air fleet reserve;
- Continue construction of Ro-Ro Class transports as well as transport vessels adapted for loading-unloading operations on an unprepared shore;
- Along with the American Merchant Marine, make extensive use of means of sea transportation of North Atlantic Alliance member nations for ocean movements.

As noted in the western press, implementation of these measures in short periods of time will assure the military-political leadership of the United States an opportunity of "showing force" with the appearance of crisis situations and on a military-strategic plane it will permit "prompt reaction to an aggravation of the situation" by moving strategic reserves from the American continent to a particular region of the world.

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PERCEPTIONS, VIEWS, COMMENTS

SOVIET COMMENTS ON U.S. METHODS FOR ESTIMATING AGGREGATE POWER

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[Article by N. Bystrov, Candidate of Military Sciences, Docent: "Methodology for Estimating a State's Power (Based on Views of Foreign Military Specialists)"; passages enclosed in slantlines printed in boldface.]

[Text] International imperialism is striving with all its might to turn backward the wheel of history--to eliminate socialism and revive capitalism as the only world system. With the most powerful military-economic potential (among other countries of the West), American imperialists dream of doing this under U.S. aegis. They assume that the question of the historic opposition of two systems can be resolved by relying on military might alone.

But such plans are becoming groundless under present-day conditions, even in the estimate of the western press, when an approximate military-strategic balance of forces has formed between the USSR and the United States and between the Warsaw Pact and NATO.

In an attempt to find new ways of attaining their aggressive goals, American specialists and politicians are calling on the White House to use the so-called "aggregate power" of the state in its estimate, with economic and military might comprising its basis. They are suggesting that an economic offensive be unfolded against the USSR and other countries of the socialist community, and that new allies with the greatest military-economic potential be included more widely for this purpose in the orbit of its aggressive politics. It is recommended that they be classified with consideration of all components of "aggregate power" of a particular state and the influence of geographic, political, psychological and other factors.

According to M. Samuels, director of Georgetown University's Center for Strategic and International Studies, who has been named among President Reagan's advisers, American political figures err deeply in defining the concept of national security only according to the criterion of military power, and this should be corrected. Samuels states: "Our security requires an offensive in the field of economics as well." Echoing him, adherents of "power" politics attempt to prove that "a genuinely serious arms race may break the back of the Soviet economy." But as emphasized in the CPSU CC Report to the 26th party congress, it is dangerous folly to try to defeat each other in an arms race and count on victory in a nuclear war.

R.S. Klein, another American "politologist" from this same university, recommends forming a so-called "ocean alliance" of 12 states which, according to his estimates, would allow uniting under U.S. aegis up to one-third of the "aggregate power" of the main capitalist countries and provide a twofold superiority over Warsaw Pact states. It is proposed to include the United States, Great Britain, France, the FRG, Japan, Italy, Canada, the Netherlands, Israel, Taiwan, Australia and New Zealand in this alliance. In demonstrating the need for adopting his ideas, Klein tries to frighten the Americans with the "communist danger" and tries to persuade them that the socialist countries allegedly are organizing and supporting revolutionary disorders in other countries (and he includes wars of national liberation here) in order to set up systems of state control similar to socialist systems in them and thus accomplish a decisive shift in the world balance of forces in favor of socialism.

Strange as it may seem, the American president also operates with the very same "arguments." He justifies U.S. claims to world leadership by no less than the "Soviet Union's intention to establish world domination through control of the world by communist states."

Specialists of the aforementioned American Center for Strategic and International Studies, in "selecting" necessary allies on the basis of an estimate of their "aggregate power," proposed to be guided by the algebraic model:

$$P_p = (C + E + M) \cdot (S + W),$$

where  $P_p$  is the state's "aggregate power"; C is the critical mass (sum of the factors of population size and area of a country's territory); E is the economic power; M is military power; S is the state's strategic goal; and W is the wish of the populace to follow the strategy existing in the country.

Military specialists from the Inter-American Defense College, agreeing on the whole with this method for determining "aggregate power" of a state, suggested the additional introduction of one other factor P--the strength of conviction of the country's political leadership and their ability to lead not only the populace of their own country, but of the allies as well. Thus the final formula for determining "aggregate power" assumes the following form:

$$P_p = (C + E + M) \cdot (S + W + P).$$

Introduction of the indicator P is substantiated by the fact that during the aggressive U.S. war in Southeast Asia many Americans not only did not support their government's policy, but even acted vigorously against it. With regard to U.S. NATO allies, here too the U.S. military-political leadership did not succeed in drawing them into the dirty war to defend the interests of American imperialism in the given area. A difference was seen in this plan between the former American and present NATO strategies: While the former bore a global character, the latter bore a regional European character. It is true that at the present time the United States is attempting to broaden the zone of NATO "responsibility."

The following approaches are proposed in estimating concrete elements of the state's "aggregate power" using the method of expert opinions. For example, it is believed that size of the population is the first indicator where its value can immediately be used to judge the importance (significance) of a particular state. Only the area of productive land (cultivated lands and pastures, Table 1) is taken into account in estimating the country's territory.

Table 1 - Area of Territory and Productive Lands of Selected Countries

Country	Area, Millions of km <sup>2</sup>		
	Country	Territory	Productive Lands
Canada	9.97	0.6 (6)*	
China	9.59	1.06 (11)	
United States	9.36	4.32 (46)	
Brazil	8.51	1.44 (17)	

\*Figures in parentheses indicate percent ratio of area of country's territory and productive lands.

/Economic power/ is considered the basis by which a state is capable of forming and building up a military potential, producing arms, accomplishing material and technical support for a modern army, air force and navy, and satisfying population requirements for goods and services. The size of the gross national product (GNP) is taken as the most generalized indicator of a state's economic power. In the most developed capitalist countries and China in 1979 it comprised (in billions of dollars): United States 2,369, Japan 1,091, the FRG 761, France 566, Great Britain 381, Italy 317, Canada 224, Spain 165 and China 373.\* In addition, it is proposed to use a comparison of the five base sectors--power engineering, industry, agriculture, trade and mineral reserves--for a more precise ranking of countries in estimating economic power. According to foreign specialists' estimates, the United States surpasses each of such developed capitalist countries as the FRG, France, Japan and certain others by 3-4 times in the economic respect.

/Military power/ is considered the main indicator of a state's power and, as emphasized in American manuals, is the chief tool in politics and diplomacy and "serves as graphic proof of U.S. resolve to employ available means for achieving the desired goals."

To simplify calculations military power is estimated based on two components of the armed forces--strategic nuclear forces and general purpose forces. The former primarily are compared by quantitative capabilities (and yields) of delivering nuclear warheads to the target, while data on personnel strength of armed forces and a number of factors determined by the method of expert opinions of the qualitative aspect of personnel, armaments, organizational structure of combined units and units as well as operational outfitting of the TVD [theater of military operations] and logistical support of units and subunits are used for describing the latter.

Table 2 provides factors for the qualitative estimate of NATO country armed forces and their equivalent capabilities for forming combat units and subunits. Foreign specialists determine these factors by the method of expert opinions.

\* Foreign specialists take 1977 into account.

Table 2 - Capabilities of NATO Countries to Form Equivalent Combat Subunits

Country	a	Quality Factors				f	g*
		b	c	d	e		
United States	2,050	1.0	1.0	0.9	0.8	0.9	1,845
FRG	495	1.0	0.9	0.9	0.7	0.9	445
France	495	0.8	0.7	0.8	0.6	0.7	346
Turkey	487	0.7	0.5	0.4	0.5	0.5	243
Italy	366	0.6	0.5	0.5	0.4	0.5	183
Great Britain	329	1.0	0.8	0.8	0.7	0.8	263
Greece	181	0.7	0.5	0.4	0.5	0.5	90
Netherlands	115	0.9	0.8	0.8	0.6	0.8	92
Belgium	88	0.9	0.8	0.8	0.6	0.8	70
Canada	78	0.9	0.6	0.6	0.6	0.7	55
Portugal	60	0.7	0.2	0.2	0.6	0.4	24
Norway	37	0.9	0.8	0.6	0.6	0.7	26
Denmark	35	0.8	0.6	0.6	0.4	0.6	21

\*Obtained by multiplying total size by average factor.

KEY: a. Total number of personnel, thousands  
 b. Personnel  
 c. Weapons  
 d. Operational outfitting of TVD and MTO  
 [logistics]  
 e. Troop organizational structure  
 f. Average factor  
 g. Number of personnel of equivalent  
 combat subunits, thousands

In the opinion of foreign specialists, the greatest difficulty comes from determining the value of the cumulative factor (the strategic goal adopted by the state and extent of its support by the populace). Theoretically this factor doubles or reduces to zero the cumulative value of "concrete power" (C + E + M). The populace of any country can "enthusiastically" support the policy of its government, not support it, or even act against it. The difficulty lies also in determining correctness in evaluating the domestic political situation. It should be noted that here too the authors of this elaboration attempt to identify the political and economic goals of bourgeois governments with the goals of the toiling masses to please their bosses.

Table 3 provides results of an evaluation of the "aggregate power" of selected states, computed by experts with consideration of the "concrete power" and factors reflecting the state's strategic objective and its degree of support by the populace.

Table 3 - Indicators of "Aggregate Power" of Selected Countries

Country	Factor Indicators			"Concrete Power"	Sum of Factors S and W	"Aggregate Power"
	C	E	M			
<i>North Atlantic Alliance Member Countries</i>						
United States	100	174	194	468	0.9	421
FRG	50	48	14	112	1.5	168
France	55	36	21	112	0.9	101
Great Britain	55	26	18	99	1.0	99
Canada	70	26	1	97	0.6	58
Italy	50	16	5	71	0.6	57
Turkey	55	3	7	65	0.6	39
Norway	15	4	1	20	1.0	20
<i>Other Countries</i>						
Japan	60	46	5	111	1.3	144
Brazil	85	7	2	94	1.3	122
Australia	40	20	-	60	1.1	66
South Korea	30	2	6	38	1.4	53
Mexico	70	4		74	0.6	44
Israel		1	21	22	1.7	37
Taiwan	10	2	11	23	1.6	37
New Zealand	10	1	-	11	1.0	11
China	100	30	42	172	0.7	120

In placing chief reliance on attaining military superiority over the Soviet Union and other countries of the socialist community, international imperialism, and American imperialism above all, is forced to take account of the approximate balance of forces which has come about in the world in seeking to attain its political and military goals. Therefore, continuing to spend enormous amounts for improving existing weapon systems and developing new ones for the purpose of building up military power and eliminating the approximate parity in forces, the United States is planning to begin a widespread offensive by capitalism in the economic field as well. To this end it is attempting to "appropriate" states with a developed military-economic potential and force them to proceed in the channel of its aggressive, adventuristic policy. To this end the U.S. military-political leadership resorts to the services of various specialists and "politologists" who develop on its orders all possible theories and methodologies similar to that presented above to justify the aggressive plans of imperialism.

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PERCEPTIONS, VIEWS, COMMENTS

SOVIET COMMENTS ON NOVEL ABOUT THE U.S. MARINE CORPS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 15-18

[Article by Capt 1st Rank (Res) T. Belashchenko: "U.S. Marines: Killer Training (From R. Flanagan's Novel 'Maggot')"]

[Excerpt] "The blow in the stomach was a complete surprise. White almost fell to his knees from the terrible pain. He was just beginning to sink downward, but a heavy blow to the chin forced him to straighten up and threw him backward against the wall. Without a moan, the soldier slowly slipped to the floor. His hands automatically grabbed his stomach and his mouth convulsively tried to get air. With the vestiges of his will he forced himself, as taught in judo lessons, to cover his head with his right arm bent at the elbow..."

"...A blow from the right hit the soldier in the lower part of the stomach. He stopped breathing from the pain and froze with open mouth. . . . At the second blow, a sharp slap, he came to. Sgt McGuire was looking him straight in the eyes. His upper lip had even lifted in disgust, exposing clenched, yellowed and uneven teeth..."

"...Heaving the duffel bags, crammed full and tied, to their shoulders, the soldiers ran heavily, describing circle after circle along the walls of the room. McGuire covered those who slowed their step even for a moment with foul language, hit them with a stick anywhere he could, and kicked them. He kicked Cooper so hard in the rear that the wretch flew several steps through the air, then sprawled full length on the floor. Before the soldier could get up the sergeant gave him a few more heavy blows. Wiping the blood from his split lip and the tears from his face, Cooper got up as best he could and ran farther, limping..."

These excerpts are not scenes from sadistic humiliations in Hitler's concentration camps for war prisoners or the product of idle conjecture. They are taken from a book published in the United States by American writer R. Flanagan entitled "Maggot," published in a Russian translation by the USSR Ministry of Defense Voyennoye izdatel'stvo.

In style this is a journalistic novel about the mores and customs of the American barracks, primarily U.S. Marine training centers where personnel are trained for units and subunits intended for carrying out gendarmerie-police, punitive functions.

What are the Marines--the elite of the Pentagon--like today? Officially they are considered a branch of the U.S. Navy.\* But as the foreign press notes, in reality it is a "semi-independent" branch of the Armed Forces representing the most mobile, technically well equipped forces ready for immediate movement to any part of the globe to carry out aggressive adventures and punitive operations. As the shock detachment of American imperialism Marines have taken part in over 300 armed provocations in their 200 years of existence. Many bloody crimes mark their path in Vietnam, where almost 100 percent of personnel in this army of cutthroats were broken in. At the present time, American Marines are taking a direct part in fighting against Salvadoran rebels and in punitive actions against Salvador's peaceful populace. Major contingents of "leathernecks," as the Marines are called in the United States, have been included in the interventionist "Rapid Deployment Force." One expeditionary Marine battalion numbering some 2,000 persons is stationed permanently aboard landing ships in the immediate vicinity of the most explosive points on the planet--the Pacific, the Persian Gulf and the Mediterranean. According to the journal U.S. NEWS AND WORLD REPORT, this "demonstrates the United States' constant readiness for intervention."

It is characteristic that according to existing U.S. law the Marines are the only component of the Armed Forces which the president can send to conduct combat operations even without the formal approval of Congress, and the White House makes wide use of this right. British philosopher B. Russell wrote: "If you wish to learn where events dangerous to the cause of peace will occur in the near future, follow the movements of the American Navy and Marines." "This is an axiom," notes U.S. NEWS AND WORLD REPORT, "if intervention again becomes the mode, then the Marines also will become fashionable again."

The "special functions" placed on the Marines by U.S. ruling circles give them a privileged position in the Armed Forces. In this connection the Pentagon attaches special importance to the selection and training of Marines, including their moral-psychological conditioning.

Primary attention in selecting Marine candidates is given to their so-called trustworthiness, which is taken to mean the ability of new recruits to be sent off to perform the dirtiest adventures after appropriate conditioning. This is what Flanagan emphasizes in his novel when he cynically admits, in the words of his main character, NCO-instructor McGuire, that the Marine is the idol of bourgeois superpatriots--"in all, a real killer, trained in his work and fearing nothing. He is ready to kill anyone he is ordered and wherever he is ordered. Anyone his superiors indicate. And he asks no questions."

To train such unreasoning killers, the American military administration has drawn up and is perfecting in every way a refined system of ideological brainwashing and spiritual corruption of the Marines, with the main place held by such elements as indoctrination in a spirit of anticomunism and hatred for everything progressive, merciless suppression of the slightest manifestation of human dignity, and the instilling of a blind fear of the commander. Marine Corps recruiting points usually ignore the fact that some of the new recruits are illiterate, many participated in various gangs before arrival in service, many had a familiarity with the police and even had been in prison.

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\*For more detail on the organizational structure of the Marines, see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 1, 1979, pp 67-73 -- Ed.

The novel "Maggot" shows this draconic school of the American barracks exceptionally vividly. It does not give the true names of privates, NCO's or officers, but nevertheless everything is documentary beginning with the description of the Parris Island Training Center itself, the barracks, garrison chapel and enormous monument to Marine Corps heroes standing in the middle of the parade ground, and ending with the characters, behavior and spiritual make-up of the personages.

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## PERCEPTIONS, VIEWS, COMMENTS

### SOVIET COMMENTS ON U.S. GROUND FORCES TACTICS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 26-31

[Article by Col N. Tsapenko, Candidate of Military Sciences, Docent: "The Company Tactical Group in the Attack"]

[Excerpt] According to views of the U.S. Army command, the offensive is the primary form of combat actions, resulting in a rout of the opposing enemy or capture of tactically favorable terrain. This is accomplished by vigorous troop actions to penetrate his defenses and a swift advance into the depth to accomplish assigned combat missions. In some instances the attack may be accomplished to identify the enemy's forces and defenses (reconnaissance in force). It is believed that a numerical superiority over the enemy of at least 6:1 in personnel and equipment must be achieved for successful penetration of defenses and swift exploitation of the attack.

As reported by the foreign military press, the battalion (infantry, mechanized and tank) is the basic tactical subunit of the U.S. Ground Forces. It usually fights as part of a brigade. The battalion may operate in the first or second echelon, be in the reserve, advance on the main or a secondary axis, and also perform a combat mission independently. Depending on this, and for the purpose of most effective use of organic and attached personnel and weapons, the battalion commander forms company tactical groups (RTG), formed on the basis of companies, for the period of combat. Make-up of a group will depend on the situation and number of subunits included in it. For example, tank platoons will predominate over mechanized platoons in a tank RTG (for example, two and one), and in a mechanized RTG to the contrary, there will be two mechanized platoons and one tank platoon. As American military specialists assume, such a resubordination of subunits provides the battalion commander with an opportunity to create the necessary grouping of personnel and weapons in the shortest time periods for accomplishing specific missions. The make-up of a tank RTG may be as follows: two tank platoons (10 M60A1 tanks), a mechanized platoon (four M113A1 APC's, four Dragon ATGM's, five M60 7.62-mm machineguns, six M203 rocket launchers and 37 M16A1 5.56-mm rifles), and a combat engineer squad. It may be supported by a Tow ATGM section (two launchers), a battery of M109A2 155-mm self-propelled howitzers (six pieces), and by other subunits where necessary.

The RTG's combat mission is assigned by the battalion commander. An immediate mission (it consists of taking an objective 1.5-2 km from the forward edge) and direction of further attack and, in some instances, immediate and subsequent missions (up to 4 km) may be assigned based on the situation. The attack frontage may be 1.2-1.5 km.

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## PERCEPTIONS, VIEWS, COMMENTS

### SOVIET COMMENTS ON U.S. METHODS OF TESTING SMALL ARMS WEAPONS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 31-33

[Article by Engr-Col D. Sokolov, Candidate of Military Sciences: "Evaluating the Effectiveness of Small Arms"]

[Excerpts] The U.S. Army command sees an increase in small arms effectiveness as one of the ways for building up the combat capabilities of Ground Forces units and combined units. A large number of mathematical models for evaluating the design and results of their combat employment have been developed for this purpose, and field testing of individual models are conducted periodically.

At the present time models of a propellant charge and designs of a bullet, cartridge case and cartridge as a whole have been created and have undergone testing, and they are being used in the course of R&D. A number of models of internal ballistics and an evaluation of weapons effectiveness also have been developed (penetration of a helmet, fire against a machinegun emplacement and pillbox, destruction of a single target, repulsing the attack of an infantry squad and so on). They are statistical and give detailed consideration to the effect of a large number of factors on firing results, including dispersion of bullets, range of fire, number of bullets in a burst, angle of site, number of aiming points, and target configuration and size. All these models have been drawn up for the IBM 360/65 and a number of calculations have been performed on their basis.

In particular, the model for repulsing an attack simulates machinegun fire against an attacking infantry squad. The following are the initial data for calculations: Attackers are distributed evenly over a rectangular sector of terrain (level, hilly or mountainous) 50x10 m in size; a machinegun mounted on a tripod fires in bursts; adjustment is performed during the attack, after which fire for effect is opened up. Table 1 [table not reproduced] provides results of hitting personnel with the M60 machinegun (a squad of ten persons on level terrain). The number of personnel put out of action from the beginning of the attack to the squad's move to the defenders' position is the criterion for evaluating effectiveness.

The probability of hitting a lone soldier at various ranges (Table 2 [table not reproduced]) was calculated using another model.

The foreign press notes that the data of tables 1 and 2 not only do not take into account the enemy's return fire, but other factors of an actual combat situation as well, because of which, in the American specialists' opinion, effectiveness of small arms may be cut in half, and chiefly as a result of the personnel's mistakes in determining range and in aiming.

In addition to modeling, the U.S. Department of the Army heads are giving considerable attention to field tests of small arms, with a near-combat situation created for their conduct. Targets are outfitted with contemporary equipment which not only registers a direct hit on them, but also determines the amount of a miss. As a rule, the target situation is controlled using EVM [electronic computers].

During range testing (Table 3 [table not reproduced]) conducted at one time for the purpose of a comparative evaluation of effectiveness of fire from the M14 and M16 rifles, it was learned that both of them have approximately identical indicators for the first criterion. Best results for the second criterion were obtained in firing the M16 rifle, since a greater number of bullets which missed the targets passed them at a distance of 2 m or closer. This rifle has better data in the capability for prolonged actions as well. It was noted that an infantry squad armed with the M16 rifle still had 72.5 percent of the unit of fire after hitting all targets in performing an "attack" scenario, while a squad with the M14 was able to keep only 47.5 percent of ammunition. The data given in the table along with other factors contributed to adoption of the M16 rifle by the Ground Forces in 1963.

At the present time, judging from foreign military press reports, U.S. Army specialists are conducting widespread comparative testing of various weapons. Conclusions are being drawn from the results as to the practical application of particular small arms models, and possibilities of their combat use are being estimated.

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PERCEPTIONS, VIEWS, COMMENTS

SOVIET COMMENTS ON FOREIGN GROUND-RECONNAISSANCE RADARS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 33-39

[Article by Engr-Col V. Dmitriyev: "Battlefield Surveillance Radars"]

[Excerpt] In analyzing combat actions in aggressive wars unleashed by the United States and Israel in recent years, and using results of numerous exercises, NATO specialists have concluded that such requirements on tactical reconnaissance equipment as promptness in obtaining reconnaissance data and the completeness and validity of the data are growing considerably under present-day conditions. In their opinion, modern equipment must provide reliable, around-the-clock reconnaissance under various meteorological and climatic conditions in any theaters of military operations in the presence both of natural and intentional jamming.

Judging from foreign press materials, the military leaders of the aggressive NATO bloc are devoting constant attention to a further build-up and improvement in tactical reconnaissance equipment, including battlefield surveillance radars. In particular, they are used widely for performing such missions as obtaining information on enemy movement (which has become an urgent need in connection with increased troop mobility), especially at night and under poor visibility.

In conformity with standards adopted by NATO, the depth and frontage of zones for performing tactical reconnaissance are: 8x5 km for the company, 15x10 km for the battalion, and 75x20 (30) km for the brigade. Battlefield surveillance radars are intended for identifying moving enemy personnel and combat equipment.

According to NATO classification, based on detection range of ground targets, radars are subdivided into four basic classes: close range (up to 3 km), short range (around 10 km), medium (approximately 20 km), and long (over 20 km) range. In addition, a class of specialized stations has appeared in recent years, intended either for detecting targets under special conditions (for example, stationary or camouflaged by vegetation), or for accomplishing specialized missions (identifying the direction of fire from small arms, recognition of ground targets, and their identification based on various features).

Among foreign battlefield surveillance radars there are more close range stations, used in reconnaissance, tactical patrol and nontactical patrol subunits and, in the armies of some countries, in platoons of combined-arms units. In addition, these radars and devices based on them are used rather widely in various automated security systems of semifixed and fixed installations (bases, airfields, aircraft at

parking areas, military-industrial enterprises, temporary troop locations and so on). Short range radars are of fewer types in comparison with the aforementioned radars, but still they are rather widespread in ground forces in capitalist armies.

Medium range radars basically are in the inventory of artillery instrumental reconnaissance subunits, for which long range radars also are intended. But only one radar of the latter class (the DR-MT-1) has been in the French Ground Forces inventory since 1958. In the evaluation of foreign experts, it is obsolete and no longer satisfies modern requirements for range, mobility, speed in obtaining and transmitting reconnaissance information, and reliability of operation.

In the opinion of foreign specialists, the following quality improvements are characteristic of some of the modern as well as future battlefield surveillance radars:

- Full automation of the processes of search, discrimination, recognition, coordinate determination, and display of detected targets. This is achieved by adoption of modern means and methods for analysis and processing of the desired signals on the basis of microelectronics, particularly identification of the signatures (characteristic features) of standard ground targets and compilation of algorithms for discrimination and recognition of targets by correlation methods;
- An increase in ECCM under conditions both of natural and intentional interference, for example, by using such methods as internal coherence of signals, pseudonoise modulation, an output increase in generating devices in radar transmitters, and statistical processing of target signals in the receiver;
- A sharp increase in operating reliability and a drop in the weight, dimensions and power used basically thanks to use of microelectronic components and instruments of new design, as well as more effective sources of power, including nickel-cadmium and lithium storage batteries.

The foreign press notes that the development of battlefield surveillance radars abroad to expand capabilities of tactical reconnaissance is following these basic directions:

- Development of light, highly reliable close range stations where precision in determining target coordinates provides an opportunity of conducting aimed small arms fire;
- Creation of portable medium range radars which a combat team of 1-3 persons can carry and deploy, as well as long range radars mounted on the ground or mounted on tethered raisable platforms;
- Provision of capability for direct connection of battlefield surveillance radars to automated data processing systems and to systems for controlling field artillery fire as well as combat subunits and units during combat;
- Development of specialized radars for accomplishing special missions (detection of stationary targets or moving targets concealed by vegetation; control of tank main gun fire; search for and detection of snipers under city conditions).

The overwhelming majority of battlefield surveillance radars in the inventory use the Doppler method for detection and discrimination of moving targets. There may be

differences either in the kind of transmitter emissions (pulse, continuous with frequency modulation, or quasicontinuous) or by the method of discriminating signals when they are received (with external or internal coherence). A trained operator usually discriminates targets by ear: The tonality, frequency and other characteristics of the desired low-frequency signal permit identification of the type of target (one person or a group of people, their number, a wheeled or tracked vehicle, its load capacity). Those which appeared in the late 1960's and early 1970's made wide use of visual displays using cathode-ray tubes, such as range displays and displays with a scan in "azimuth-range" coordinates, as well as digital displays for direct read-out of target coordinates in a polar system (azimuth and range) or in geographic coordinates (on condition of a topographic tie-in). Meanwhile, in the opinion of foreign specialists, the operating principles being used in the radars give rise to a number of their deficiencies. In particular, this precludes combat employment in movement and the detection of stationary or camouflaged targets (except for specialized radars). In addition, these radars have poor operating security (due to the transmitter's active emissions) and are subject to the effect of enemy electronic countermeasures.

As noted in the foreign press, the United States and France (see table [table not reproduced]) are conducting the most extensive development of battlefield surveillance radars. Great Britain, Italy, Israel, Denmark and Sweden also have radars of their own manufacture. Armies of other capitalist states basically have American, French and, in part, British models in the inventory.

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PERCEPTIONS, VIEWS, COMMENTS

SOVIET COMMENTS ON NATO AIR TACTICS AGAINST ARMORED FORCES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 41-45

[Article by Col M. Semenyuk, Candidate of Military Sciences, and Col V. Tarabanov, Candidate of Military Sciences, Docent: "Combating Armored Ground Targets (Based on Foreign Military Specialists' Views)"; passages enclosed in slantlines printed in boldface.]

[Text] In connection with the saturation of troop units with armored equipment, the military leaders of the aggressive imperialist NATO bloc are viewing combat against armored ground targets as a most important mission in modern warfare, especially in European theaters of military operations. To accomplish it, ground forces are outfitted with a large number of antitank weapons: ATGM's [antitank guided missiles], antitank artillery, antitank rocket launchers and so on. But in the opinion of foreign specialists, no matter how high the degree of saturation of ground forces with antitank weapons, they will not be able to oppose effectively the highly mobile armored groupings with great firepower, especially if the latter have good air support. Based on this NATO's military experts concluded the need for using aircraft to combat enemy armored forces. In their opinion tanks, IFV's [infantry fighting vehicles], APC's [armored personnel carriers] and other kinds of armored ground equipment are most vulnerable from the air, which makes aircraft a most important means of combating them.

As a rule, present-day armored groupings have a rather solid cover against air strikes. Along with fighters, this includes surface-to-air missile [SAM] and anti-aircraft artillery systems, a significant part of which is mounted on self-propelled chassis and proceeds in combat formations of the armored subunits. As the foreign press writes, all this poses for aviation one of the basic problems in searching for effective means and methods of destroying armored ground targets under conditions of opposition by a strong air defense system. For this reason NATO countries are conducting intensive explorations for ways of solving it along the following basic lines: achieving timeliness and precision in detecting armored ground targets and objects of their air defense cover; improving existing means and creating new ones for neutralizing the air defense system and hitting the targets themselves; exploring tactics allowing most effective use of these means.

In the views of western military aviation specialists, the fight against enemy armored forces is arbitrarily subdivided into three phases: aerial reconnaissance, neutralization of air defense and delivery of strikes.

/Aerial reconnaissance/ is one of the most important kinds of support to combat operations and is intended for uncovering enemy groupings and enemy plans. Its data are used to determine strike objectives, the force of personnel and weapons, procedure for air operations, and coordination between the aircraft and other branches of the armed forces.

According to views of NATO military specialists, the following missions are assigned to aerial reconnaissance in combating enemy armored forces: search and detection of armored units and combined units, exposure of their air defense system and combat formations, determination of coordinates of strike objectives, and vectoring of tactical aviation to them. Special reconnaissance aircraft or series-produced combat aircraft outfitted with suspended reconnaissance equipment are assigned to accomplish these missions.

The NATO command believes that an increase in effectiveness of aerial reconnaissance can be achieved by the integrated employment of forces and means at the Air Force's disposal, by their further development and by improving the training of reconnaissance aircraft crews.

According to foreign press reports, the United States and other member nations of the NATO bloc have created a considerable number of different pieces of equipment for conducting aerial reconnaissance. They can be used for the search, detection, determination of combat formations and coordinates of enemy armored groupings, and for vectoring friendly aircraft to them. Work continues on improving existing equipment and creating new equipment for such purposes.

In particular, a helicopter-mounted system for detecting moving ground targets, which consists of onboard and ground equipment, has been developed in the United States on an order from the Army and Air Force. The onboard equipment is a side-looking radar installed in the UH-60 helicopter, and the other equipment is a ground station (which also includes a radar), which tracks the helicopter in flight and determines its coordinates continuously. Data on targets being detected by the airborne radar are passed to an EVM [electronic computer] installed in the helicopter. Information on the helicopter's location also is sent there from the ground station. The EVM computes target coordinates and transmits them to points for collection and processing of the data needed by the command for decisionmaking.

In addition, U.S. Air Force specialists are developing a new PLSS\* [Precision Location Strike System] integrated automated system which in their opinion will permit reconnaissance of various enemy air defense systems by intersecting, identifying the type and determining location of operating radars, and vectoring tactical strike aircraft and their weapons to them with high precision. It is also planned to be used to deliver strikes against nonemitting objects, including accumulations of armored equipment detected by other means of aerial reconnaissance.

An increase in mastery of reconnaissance aircraft crews is achieved chiefly through their planned theoretical and practical training. To this end classes are arranged on the ground and regular training flights are made for performing various reconnaissance missions. In addition to performing aerial reconnaissance by the traditional visual method, the crews practice intensively in using radar, infrared, television, laser and other equipment aboard the aircraft.

\*For more detail about this system see ZARUBEZHNOYE VOYENNOYE OBOZRENIYE, No 5, 1980, pp 55-57 -- Ed.

/Neutralization of air defense/ of enemy armored groupings can be carried out, as noted in the foreign military press, by aircraft especially intended for this purpose as well as by conventional tactical fighters and ground attack aircraft assigned from those participating in raids by air units and subunits. Ground Forces personnel and weapons, including artillery and fire support helicopters, may be used for neutralizing air defense weapons when strikes are delivered against tanks, APC's, IFV's and other armored equipment on the battlefield or for supporting the over-flight of tactical aircraft to the depth of enemy combat formations.

Aerial bombs and guided and unguided missiles are used in delivering strikes against air defense weapons. Foreign military specialists consider the radars in the control systems to be the most vulnerable spot of surface-to-air missile and antiaircraft artillery systems. For this reason greatest attention is given to working out methods for combat employment of Shrike antiradiation missiles as well as means of active and passive jamming.

As reported in the foreign press, the United States has developed and accepted for operation the F-4G Wild Weasel aircraft especially intended for suppressing and destroying air defense weapons. It is outfitted with equipment providing for detection of air defense system radars and jamming them, and it also can deliver up to four Shrike antiradiation UR [guided missiles] or two Standard ARM missiles and other weapons. The operating tactics of these aircraft depend on the situation. According to data published in the western press, crews undergoing combat training practice flights at low, extremely low and medium altitudes. In exercises conducted in the United States and Western Europe, F-4G aircraft operated both independently and as part of strike groups (in the latter instance they were assigned most often for suppressing the target's air defense). They practiced delivering attacks chiefly with antiradiation missiles without entering the zone of coverage of "enemy" ground-based air defense weapons where possible. To force the "enemy" to turn on ZUR [SAM] and ZA [antiaircraft artillery] control radars, they often would employ demonstrations by individual aircraft or groups.

/Making an attack./ Aircraft can employ various weapons to destroy armored ground targets: guided and unguided missiles, bombs and cluster bombs, and aircraft cannon. Tactics of delivering attacks also change depending on the nature of the target, the situation and kind of weapon being employed.

As reported in the foreign press, the Maverick UR equipped with television homing head and providing high accuracy for the missile to hit the target came into the inventory of tactical aviation of the United States and certain other NATO countries in the 1970's.

The NATO military leadership figures on having a large number of aircraft in the 1980's equipped with launchers for the Maverick UR, including: the A7 and A10 ground attack aircraft and the F-4, F-5E, F-111 and F-16 tactical fighters. In the views of western specialists, guided aerial bombs (such as the Walleye and GBU-15) also will be used widely in combating tanks and other armored targets. It is believed that in employing homing missiles and bombs, aviation subunits have an opportunity to attack targets often without entering the killing zones of screening air defense systems or being in them for a minimum time, and this in turn should reduce aircraft loss considerably.

In particular, if a target is near the front line, then the line of attack usually passes over territory occupied by friendly forces and outside the killing zone of forward enemy air defense weapons. Attack groups of tactical fighters carry out the flight at medium altitude. On detecting and identifying a target, their crews lock onto it with the missile (guided bomb) homing heads and launch (release) them, after which they perform a power turn from the front line with a simultaneous change in altitude. Subsequent attacks are conducted according to the very same scheme.

If the attack objective is a great distance from the front line (in the depth of enemy combat formations), then the flight route is chosen so that there are as few air defense weapons in its path as possible. The attack group flies at low altitude. On arriving in the target area the aircraft crews quickly climb to the necessary altitude, turn toward the target and attack it. After this they go into a power dive to low or extremely low altitude and depart from the target at high speed.

As a rule, the attack groups' combat actions are supported by EW [electronic warfare] aircraft, forward air controllers, and other personnel and means.

Variants of the practice described above for attacks on armored ground targets using homing missiles (guided aerial bombs) are shown in Fig. 1 [figure not reproduced].

In bombing against area targets, particularly against concentrations of tanks and other armored equipment (using special cluster bombs or sticks of conventional aerial bombs), the crews of tactical fighters and ground attack aircraft are instructed to take the aircraft over the target to increase the effectiveness of the strike. Two versions of operations are possible in case dispensing aerial bombs are used: a pass over the target while maintaining a given altitude (Fig. 2a [figure not reproduced]) or performance of an evasive power maneuver immediately after releasing the bomb (Fig. 2b [figure not reproduced]).

In addition to various bomb armaments, tactical aircraft can employ aircraft cannon successfully in operations against armored equipment, in the opinion of foreign specialists. The foreign press emphasizes that heavy caliber aircraft cannon such as the American GAU-8/A installed in the A-10 ground attack aircraft and specially designed for hitting armored targets, are most effective in this respect. This 30-mm gun has, according to western press reports, a high rate of fire and high firing accuracy and its rounds have high armor-penetrating capability. Firing from a shallow dive is considered the basic tactic when these ground attack aircraft operate against ground targets using the cannon. According to foreign specialists' views, one of the shortcomings in delivering such strikes is the need to maintain course and flight speed strictly while conducting fire and closing with the target (in connection with the short range of fire). In their opinion, all this restricts the aircraft's maneuver and increases the probability of its being hit by enemy air defense weapons.

On the whole, foreign military specialists attach great significance to organizing and conducting combat against armored ground targets under conditions of strong air defense. New tactics and operating methods are being sought constantly simultaneously with the improvement in equipment for detecting armored targets day and night in all meteorological conditions. Some of them are tested under range conditions and others are tested in aggressive wars constantly being unleashed by imperialism in one part of the globe or another.

In all cases the basic principles of developing tactics for overcoming air defense are: concealed approach to the target, bypassing of killing zones of enemy air defense weapons, their vigorous suppression, surprise, a power maneuver (a sharp change in direction, speed and altitude), and a reduction in time spent in the killing zone of the ZUR and ZA.

Support groups are formed to increase the effectiveness of actions by aviation attack subunits: groups for ECM, groups for final reconnaissance and designation of the target, fighter cover, demonstration groups, and groups for suppressing air defense weapons along the aircraft flight route and in the target area. Their actions are planned carefully and coordinated with the actions of strike groups.

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PERCEPTIONS, VIEWS, COMMENTS

COMMENTS ON NEW PROPULSION SYSTEMS FOR NATO AIR-LAUNCHED MISSILES

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 52-55

[Article by Engr-Lt Col B. Semenov: "New Engines for Air-Launched Missiles"]

[Text] Present-day air-launched guided missiles (UR) are equipped chiefly with solid-propellant engines. In the opinion of foreign military specialists, they have satisfactory thrust characteristics, are simple in design, are convenient and safe to operate and are inexpensive, but at the same time they are effective only at a relatively short range of fire. Judging from foreign press reports, programs for the development of future air-to-air and air-to-ground class UR envisage the creation of supersonic missiles with ranges considerably exceeding presently existing ones (several hundred kilometers). In this case, as western experts assume, solid-propellant engines are becoming ineffective as a result of the sharp increase in specific weight of the propulsion unit in the missile's total weight. This circumstance is what served as the reason for increased interest in foreign countries in work being conducted in creating ramjet engines (PVRD) for UR.

In solid-propellant rocket engines (RDTT) the oxidizer in the composite propellant comprises up to 80 percent, while the PVRD uses oxygen entering with the air from the outside. With a long range of fire, which means prolonged operation of the engine, the determining characteristic is the specific impulse (the ratio of thrust to fuel consumption per second), which is 4-6 times greater for the PVRD than the RDTT, while the volumetric impulse (the product of specific impulse and fuel density) is three times greater than the RDTT with their volume being the same.

A missile must be given a certain speed, such as with the help of a launching booster, to place the PVRD into operation. As a rule, boosters are accommodated along the sides of the body and jettisoned after completion of operation in surface-to-surface and surface-to-air missiles. This makes the design cumbersome, which in turn retarded the use of PVRD as engines for air-launched UR (air-to-air and air-to-surface). The rigid requirements on limiting the size of such missiles led to the need to create new compact propulsion units wherein the distinguishing design feature was the placement of the solid-propellant launching booster within the PVRD combustion chamber. They were designated combination rocket-ramjet engines (KRPD, Fig. 1 [figure not reproduced]). In the estimate of foreign specialists, this configuration permits reducing the volume of the propulsion unit by 30-40 percent.

At the present time several versions of combination engines with PVRD using liquid or solid propellant are being developed abroad. The primary merit of the liquid-propellant PVRD (it was initially proposed to use kerosene as the fuel and in the long term higher density hydrocarbon fuels and fuels containing boron) is considered the relatively simple thrust control. It is planned to accomplish this by changing the fuel supply to the combustion chamber depending on flight conditions. The possibility of controlling thrust will permit an increase in the missile's speed at the moment it encounters the target, which will increase its killing action. The western press notes that the solid-propellant PVRD has the following advantages over liquid-propellant PVRD: simplicity of design, inasmuch as the need for fuel pumps and feed regulators disappears; increased reliability because of fewer elements and design simplicity; greater range of missile fire with the same volume occupied by the fuel (this is achieved through greater density of solid propellant). At the same time, a basic shortcoming of solid-propellant PVRD's is noted--difficulty of thrust control.

The combination rocket-ramjet engines with solid-propellant PVRD are being made in two types: with a so-called open combustion arrangement and with a gas generator (Fig. 2 [figure not reproduced]). In the first type of engine the launching booster (solid propellant with oxidizer) is accommodated within the main charge (solid propellant with a small amount of oxidizer). After the booster burns out the main charge propellant is subjected to ablation under the effect of high temperatures and then its products mix with the air and burn. In the opinion of foreign experts, such an engine has the simplest design, but it is very difficult to accomplish thrust control in it.

The following occurs in the second type of KRPD: Initially there is combustion of the solid propellant, such as a compound of powdered magnesium and a polymer substance, in the gas generator and the gaseous products formed enter the PVRD combustion chamber and are afterburned here (it is necessary for the combustion chamber to have the greatest possible volume to assure effective mixing of gaseous products and air). According to a western press report, the American firm of United Technologies presently is working to create such a type of rocket-ramjet engine wherein thrust control is accomplished by changing the consumption of combustion products coming from the gas generator into the combustion chamber. The use of needle valves is considered one of the most promising design solutions to this problem. It is also reported that it is planned to install the KRPD with gas generator chiefly in air-to-air UR.

As the foreign press indicates, the United States, France and the FRG are conducting the most intensive work to make KRPD's. In particular, research began in the United States with the appearance of the ALVRJ [Air-Launched Low-Volume Ramjet] program, the purpose of which is to study the possibility of using low-volume KRPD in tactical missiles (flight testing of the engines began in 1974). According to a statement by American military specialists, launches of experimental missiles (Fig. 3 [figure not reproduced]) conducted in accordance with this program confirmed the expediency of developing KRPD's for air-to-air and air-to-surface UR.

At the present time air-to-air UR equipped with KRPD are being developed for the U.S. Air Force and Navy: AMRAAM (medium range) and AIAAM (long range). According to information given in the foreign press, the AMRAAM will have a launch weight of some 135 kg, a speed of Mach 2.5-3 and a range of 80-90 km. It is also noted that the Sparrow AIM-7F missile, the most sophisticated of existing medium range UR, has

a maximum range of some 50 km with a launching weight of 230 kg, while the AIAAM missile will have considerably greater range (with approximately the same size as the Phoenix UR).

Another representative of a future American missile with KRPD is the STM air-to-surface UR.

It now is in the stage of flight testing of experimental models, during which the propulsion unit--a KRPD (solid-propellant booster and liquid-propellant PVRD)--is being worked out. Launches of several models of UR were conducted in the period 1979-1980. A speed in the mid-course leg of the trajectory of some 3,000 km/hr was noted during the tests. It is planned to make the STM missile operational in the mid-1980's.

Research began in France in 1972 to create a KRPD and in 1976 flight tests of experimental models were conducted. The operation of air intakes and combustion chambers was checked during the tests. The results obtained became the basis for development of new UR's with such engines, especially the ASMP (of the Aerospatiale firm). According to requirements placed on this missile, it is to have a supersonic flight speed at high and low altitudes, high maneuverability, considerable over-loads, and the capability of altering flight profile with consideration of terrain relief. According to a statement by firm specialists, these requirements determined choice of the KRPD as the propulsion unit, creation of which is being accomplished jointly by the national agency ONERA and the firm Aerospatiale. It is proposed to use aviation kerosene (a density of 0.78 g/cm<sup>3</sup>) as fuel for the PVRD, and later it is planned to use weighted aviation fuel (up to 1.1 g/cm<sup>3</sup>). The solid-propellant launching booster accommodated within the PVRD combustion chamber will give the UR a speed of around Mach 2. Ground bench trials of the ASMP began in 1980 and its practice launches from an aircraft are planned for 1982.

Great Britain, France and the FRG are conducting a joint development of an air-launched antiship supersonic missile, the ASSM. The West German firm of MBB and the French national agency ONERA are creating the propulsion unit for it (a combination rocket-ramjet engine with solid-propellant PVRD) on a competitive basis. As the western press reports, after conduct of preliminary studies specialists of the MBB firm chose a high-energy fuel containing boron (density of 1.7 g/cm<sup>3</sup>) for the PVRD, while experts from the ONERA agency concluded the expediency for using a composite propellant with ammonium perchlorate (1.3 g/cm<sup>3</sup>) containing 10-15 times less oxidizer than conventional rocket propellant and special additives reducing smoke generation and increasing the engine's specific impulse. It is planned to use a gas generator in the KRPD design, behind which will be accommodated a combustion chamber (a length of some 80 cm). In conformity with requirements, a thrust control of from 800 to 3,000 kg is to be provided for in the engine. It is planned to provide this by changing the area of critical cross section of the gas generator nozzle by shifting the cone in an axial direction within it.

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PERCEPTIONS, VIEWS, COMMENTS

COMMENTS ON FLIGHT TESTS OF B-1 BOMBER

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) p 55

[Article by Engr-Col V. Kirsanov: "Completion of B-1 Bomber Flight Tests"]

[Text] According to foreign press reports, the United States completed flight tests of the strategic B-1 bomber, which lasted over six years, in April 1981. Four experimental models were built to perform a comprehensive evaluation of the new aircraft and for its integrated ground checks and studies. The first flight of the B-1 was held on 23 December 1974 and, in accordance with the program, the fourth model made its last flight on 30 April 1981 (tests of the third model were completed two weeks earlier). The foreign press notes that the aircraft made 247 flights during the flight tests with a total flying time of 1,895 hours, of which the third model flew 138 times for 829 hours and the fourth flew 70 times for 378 hours.

The initial plan envisaged completion of the flight test program in the period 1982-1983, but the decision was made in June 1977 not to begin series production of this bomber because of its high cost (over \$100 million for one aircraft). Therefore the U.S. Air Force command revised the time periods and scope of the R&D program, concentrating main efforts in recent years on checking the working capacity, effectiveness and combat capabilities of onboard electronic systems.

In connection with completion of R&D the Air Force command intends to cease B-1 flights completely, carry out a work cycle for mothballing them and store them subsequently at Edwards Air Base (California). Mothballing will be conducted by specialists of the Rockwell International firm. It is not precluded that in case the Reagan Administration decides to create a new strategic multipurpose bomber on the basis of the B-1, existing experimental models will be demothballed and used for conducting further studies. In particular, it is planned to perform modernization of the second and fourth experimental models in short periods of time and then use the second model for conducting strength tests and a check of all onboard subsystems and assemblies, and the fourth model for a comprehensive evaluation of the electronics.

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PERCEPTIONS, VIEWS, COMMENTS

COMMENTS ON HELICOPTER FLIGHTS FROM U.S. NAVY SHIPS

Moscow ZARUBEZHNOYE VOYENNOYE OBOZRENIYE in Russian No 9, Sep 81 (signed to press 7 Sep 81) pp 57-60

[Article by Col M. Panin: "Helicopter Flights from the Deck of American Ships"; passages enclosed in slantlines printed in boldface.]

[Text] In accelerating the build-up in power of the Navy, which is viewed by U.S. ruling circles as a mobile branch of the Armed Forces intended, together with the Air Force and Ground Forces to help achieve their aggressive objectives, the Navy command is paying special attention to the introduction of helicopters into the fleets. As emphasized in the foreign press, they are intended to provide antisubmarine and, in some cases, antimissile defense of individual ships and forces, to transport cargoes and people, to carry out search and rescue of persons who have been shipwrecked or have been in an air disaster at sea, and perform reconnaissance. American military specialists consider helicopters an inalienable part of the ship's weapons.

As reported by the western press, the U.S. Navy has some 220 ships of various types (not counting aircraft carriers) with helicopters aboard. In addition, the Coast Guard has 35 such ships.

In conformity with the administrative organization assuming the basing of helicopters at shore bases, they are placed in squadrons and the latter are part of air wings. According to the American press, the regular Navy has 29 helicopter squadrons, of which 12 have the SH-3H Sea King antisubmarine helicopters, eight have the SH-2F Sea Sprite light antisubmarine helicopters of the LAMPS Mk 1 system, three have the RH-53D Sea Stallion heavy helicopter minesweepers, and six with the UH-46 Sea Knight and CH-3 Sea King assault transport helicopters. All helicopters (with the exception of the minesweepers) can perform combat missions at sea from single ships fitted with the appropriate equipment.

According to operational organization, helicopters are accommodated aboard ships (one or two each). Flight and servicing personnel are placed in an air department. If there is one helicopter aboard ship, the department consists of four officer pilots and eleven NCO's and privates (mechanics, electronics technicians, electricians, sonar operators), and if there are two, then the number of pilots is increased to six and one more sonar operator and two technicians are added.

The helicopter subunit is activated and undergoes combat training in its squadron on shore. When it is aboard ship, the senior officer is designated the air department

head (if a department is not set up, the functions of senior officer for aviation matters are performed by the head of the missile-gunnery department). Administratively he is subordinate to the squadron commander, and operationally to the ship's commanding officer. The head of the air department handles the planning and organization of combat training of the crews. All documentation is kept in two copies: for the ship's and squadron records.

A support group is given responsibility for direct support of flights by shipboard helicopters. The group consists of 12-14 persons: control officer (flight controller), signalman specialist, the person who gives visual signals to the pilot during take-off and landing, two telephone operators, 2-3 mechanics, 5-6 persons on the firefighting team and a corpsman. The flight controller is appointed from among pilots who have completed appropriate courses. He controls all operations on the flight deck from a special post, maintains constant contact with the helicopter and the primary control station, and controls the take-off, landing and flights within a radius up to 9 km from the ship. The signalman specialist (appointed from rank-and-file personnel of the air department and located constantly on the helicopter pad) duplicates the flight controller's instructions by giving conventional signals (for engine start-up, taxiing, a turn, lift-off, hovering, touching down on the deck during the landing and others) by means of visual communications. The mechanics ensure that the helicopter is secured and fueled. The firefighting team and corpsman are persons from the ship's company.

The ship's combat information center (BIP) exercises primary control and supervision over the helicopter's flight. It maintains continuous contact with the crew and informs the pilot of a change in meteorological conditions, a change in the ship's course or speed, and also loss of radar contact.

The ship's commanding officer makes the decision for conducting flight operations. It is apparent from American press reports that the following procedure for releasing helicopters exists aboard U.S. Navy ships. Readiness for helicopter take-off is announced to all stations, the ship's course is changed if necessary to create optimum wind conditions,<sup>1</sup> a red light is switched on on the bridge and the "Hotel" flag is readied on the halyards. At the flight controller's command and the signalman specialist's signal, the helicopter crew starts engines, then the pilot reports readiness to engage the main rotor. Ensuring that the deck is clear, the signalman gives the signal permitting this operation to be accomplished. Then comes the flight controller's report to the GKP [control center] about the helicopter's readiness to take off. After this the red light is turned off and a green light switched on and the "Hotel" flag is hoisted. After checking the operation of cockpit instruments right before take-off, the pilot shows the signalman two raised fingers (at night the navigating lights are turned on at half brightness), and the signalman orders the mechanics: "Remove tiedowns." Cables and brake blocks are removed and shown to the pilot without fail, and the signalman raises as many fingers as there were tiedowns (three accidents already are known in the U.S. Navy where not all tiedowns were disconnected during take-off). Only after this does the helicopter lift off. Then the red light is switched on on the bridge (the green light is turned off) and the "Hotel" flag is lowered halfway.

1. The ship's movement against the wind is the optimum condition for conducting helicopter flight operations. In this case their take-off and landing practically are independent of wind velocity. The permissible speed of a crosswind is no more than 2.5 m/sec -- Ed.

The landing is the most difficult phase of a helicopter flight. To accomplish this the ship turns against the wind, the red light is turned off and the green light turned on, and the "Hotel" flag is hoisted to the butt. The signalman takes up a position on the landing pad so the pilot can see him easily. After receiving a report from the crew about landing gear being lowered, the flight controller gives permission for a landing. When it has been accomplished, blocks in place and tie-downs made, the red light is turned on (the green light is turned off) and the "Hotel" flag is removed. If there will be no more flights, the red light also is turned off.

In two-place helicopters the landing may be performed by the left pilot (the copilot). In this case the helicopter commander (the right pilot) extends his hand from the cockpit indicating to the signalman that he is not controlling the helicopter and that the signalman should stand so as to have the copilot in sight all the time and to be sure that he understands his signals.

Judging from foreign press reports, the helicopter's approach for a landing and the landing can be accomplished according to the following schemes depending on the ship's outfitting with technical flight support equipment.

/Helicopter landing on the deck of a ship fitted with the TACAN radio navigation system (Fig. 1 [figure not reproduced]). Proceeding along a bearing toward the TACAN radio beacon at an altitude of at least 150 m, the helicopter moves to a given control point, which is at an angle to the ship of 150° (to starboard or port) at a distance of 5.5 km. After arriving at that point, the pilot begins a descent or, at the flight controller's command, heads for the holding area, which is a closed elliptical pattern with sides of 1.8 km.

On receiving the command for further descent and landing, the pilot returns to the control point, gets on a magnetic course ( $MK_v$ ) equal to the ship's magnetic course ( $MK_k$ )  $\pm 30^\circ$ , and reports to the ship his course, altitude and speed.<sup>2</sup> Continuing the descent, he announces crossing the 3.7 km line. Descending to a height of 90 m, the pilot lowers the helicopter landing gear and reports his course, altitude, speed and amount of fuel remaining. After this he usually reports: "Ship in sight" and makes the landing. As noted in the western press, the landing of U.S. Navy helicopters is authorized with a visibility of at least 900 m and cloud cover no lower than 90 m. If the pilot does not observe the ship or its wake from a height of 90 m, further descent is prohibited and, depending on conditions, the helicopter makes another pass or proceeds to an alternate airfield (if the fuel remainder permits).

On a repeat pass the pilot climbs to a height of 150 m without changing course and, after departing to a distance of 3.7 km, turns the helicopter left to a course opposite that of the ship. At this altitude he proceeds to a reserve control point, which is 7.4 km astern of a ship proceeding on a course opposite the wind. The altitude at that point is 150 m or more (on instructions from the BIP). The holding area is similar to the primary holding area. If there were two helicopters in the air, the second helicopter comes in for a landing following the primary pattern, while the first helicopter follows the reserve pattern.

2. According to foreign press data, a helicopter's speed in the landing approach is 110-130 km/hr -- Ed.

/Helicopter landing on the deck of a ship with a nondirectional radio beacon/ (Fig. 2 [figure not reproduced]). The pilot approaches the ship on a bearing to the radio beacon. After passing over the ship he turns the helicopter to a course equal to  $MK_k$  (a speed of 130 km/hr). The helicopter proceeds on this course for one minute, then turns left and again approaches the radio beacon. If visibility is good at the given moment he flies a circuit and makes the landing approach visually (Fig. 2, dotted line). Under conditions of heavy cloud cover the pilot holds an estimated course of  $MK_k + 150^\circ$  after the second pass and begins to descend to an altitude no less than 90 m. After flying this course for 1½ minutes he turns right to the landing course equal to  $MK_k$ . If he has not broken through the clouds, the helicopter climbs toward the radio beacon a third time, and then the pilot acts according to instructions of the flight controller. The  $MK_k$  must be constant from the moment of the helicopter's first pass over the ship.

/Helicopter landing on the ship's deck following commands of the shipboard radar operator/. If the ship has neither a TACAN radio navigation system nor a nondirectional radio beacon, the landing is performed with the help of an aircraft detection radar. The helicopter crew monitors its location with respect to the ship using onboard radar.

The radar operator informs the pilot of range and azimuth and vectors the aircraft into the sector of  $130^\circ$ - $210^\circ$  astern of the ship so that the aircraft is at an altitude of no less than 150 m at a distance of 5.5 km. Then the pilot begins a descent to a height of 90 m and lowers the landing gear. The decision is made for landing or going around again at a range of 900 m and a height of 90 m.

As the American press notes, the U.S. Navy presently is testing a special device for rapid, safe helicopter landing under unfavorable hydrometeorological conditions--the RAST (Recovery, Assist, Secure and Traverse). The basis of its operation is the principle of drawing the helicopter forcibly toward the deck by a winch with the help of a line supplied to the helicopter. An auxiliary line is lowered from the helicopter, hovering 6-8 m above the pad, and this is connected with a ship's line hooked to a hydraulic winch aboard ship. The ship's line is taken in and attached to the helicopter. Then the RAST operator activates the winch from the control console and draws the craft to the deck. A special rod on the helicopter enters a quick-acting locking device and is secured. The entire process of drawing in and locking the helicopter lasts 4 seconds. At the moment the helicopter touches the deck engines are cut and blades of the main rotor are folded. Then the helicopter is towed into the hangar with the help of the RAST device. The device allows a helicopter to land with the ship rolling up to  $28^\circ$  and pitching up to  $5^\circ$ .

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